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Journal of the Society of Arts.

FRIDAY, JANUARY 16, 1863.

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SIXTH ORDINARY MEETING.

Wednesday, January 14, 1863.

The Sixth Ordinary Meeting of the One Hundred and Ninth Session was held on Wednesday, the 14th inst., the Hon. and Rev. Samuel Best, Member of Council, in the chair.

The following candidates were proposed for election as members of the Society :—

Blanchard, Mark Henry.	74, Blackfriars-road, S.
Burrell, Alexander	Gresham Club, E.C.
Challis, J. H.	35, St. James's-place, S.W.
Combe, James	(Jas. Combe and Co.), Belfast.
Duncan, Lieut. Francis, LL.D., &c.	Woolwich, S.E.
Fordham, Thomas........	18, St. Mary's-ter., Westmoreland-place, Paddington, W.
Hoe, Richard March	New York.
Livingstone, A. S.	Adelaide-cottage, Carlton-road, Peckham, S.E.
Loveridge, Henry	Wolverhampton.
Lückes, Henry Richards.	Ross, Herefordshire.
Myddleton, David.........	Burton, near Lincoln.
Nicole, Adolphe............	14, Soho-square, W.
Pairpoint, Thomas Francis	7, Green-street, Leicester-square, W.C.
Ravaison, Walter	8, Richmond-buildings, Dean-street, Soho, W.
Robinson, John	Atlas Works, Manchester.
Sawyer, The Rev. Walter John	Belle Vue House, near Ross, Herefordshire.
Stenson, Joseph......... ...	Northampton.
Wadsworth, James	21, St. Symon's-street, Salford, Manchester.

And as Honorary Corresponding Member,

Macchi, Mauro, M.P. ...	Turin.

The following Candidates were balloted for and duly elected members of the Society :—

Bradley, John	129, Fore-street-hill, Exeter.
Duck, George N.	Blue House, Stockton-on-Tees
Gowland, Edward B. ...	1, Brecknock-street, Camden Town, N.W.
Hewlett, Alfred............	Haigh Colliery, near Wigan.
Lister, John	Shibden Hall, near Halifax.
McBride, Dr. Henry	Gilford, Co. Down, Ireland.
Mitchell, Wm. Lawrence	22, Richmond-street, S.
Noden, Edward Byron ...	Terrace House, Old Kent-road, S.E.
Robertson, Alexander ...	Holloway Mills, N.
Scott, Thomas	7, Randolph Cliff, Edinburgh
Scott, William	12, Westbourne place, Eaton-square, S.W.
Smyth, Samuel R...........	Dover.
Steinthal, G. A.............	14, Little Tower-street, E.C.

And as Honorary Corresponding Member,

Mairet, Sylvain	Locle, Switzerland.

The Paper read was—

THE APPLICATION OF PHOTOGRAPHY TO THE MAGIC LANTERN, EDUCATIONALLY CONSIDERED.

By Samuel Highley, F.G.S., F.C.S., &c.

It may seem strange (to some presumptuous) that anyone should wish a body like the Society of Arts to give an evening's consideration to that reminiscence of the nursery, the Galanty Show, to that toy of our boyhood, the Magic Lantern. Many scientific phenomena, when first discovered, either from their remarkability or beauty, have excited much interest in the popular mind, but have only been regarded by it as pleasing toys, till in the course of time their practical value has been discovered, and *they have* been ranked in the list of applied sciences.

Such was the globe of water, magnifying in distorted form the fly or flower, till in the hands of science it sprang into that exquisite refinement of optical knowledge, " the Microscope," that discoverer of hidden worlds and life, and the seat or form of disease within the inmost walls of the human frame. Such the Kaleidoscope, the tin case with its bits of coloured glass, regarded long only as a wonder from the fair, till in practical hands we find ourselves indebted to its aid for many of the beautiful geometric designs which ornament our walls or floors.

So likewise the Camera-obscura, the discovery of Baptista Porta, of Padua, till the progress of chemical knowledge revealed to us the means of fixing its fleeting images; and even then its products, together with its adjunct, the stereoscope, were little thought of in *their most valuable* practical bearings. Of late, however, this has rapidly impressed itself upon us, though we cannot as yet even see the limits of its Educational utility.

In Microscopy, Natural History, Physiological, and Pathological research, what an invaluable agent does Photography prove; for Nature here depicts herself with her own pencil, and, possibly, ere long from her own palette, *and in this resides* one of its greatest values, for *truthfulness* is insured, and our studies are delineated with a faithful and unbiassed hand; with what minuteness of detail, the photographs I shall exhibit will bear witness.

I trust that I shall be able to prove this evening, to many who may not previously have given attention to the subject, that the Magic Lantern is likewise, with attention, destined to become an instrument of great Educational value. We are most of us aware that Natural History designs have been produced by the ordinary Magic Lantern colourist, and many such subjects, even produced with care, have made us exclaim with Polonius that the representations have been, —— " very like a whale." Undoubtedly many subjects painted for the lantern are really artistic productions; but can the best artist for one moment pretend to cope with Dame Nature in her artistic moods? Can any artist (even a pre-Raphaelite) for one moment hope to introduce the amount of detail she, with her undulating brushes of light, fixes upon the film which her assistant the chemist, has prepared for her? For it must be borne in mind, that while the Artist delights in *broad effects*, the Naturalist regards *detail* as a *sine qua non*, their aims being different; and it must be patent to every one, that while the painted views we have long been accustomed to to meet every requirement, where mere amusement is concerned, photographic transparencies on glass will be the great means by which the Magic Lantern will be rendered subservient to the purposes of instruction.

Although many persons in private have employed photographs for the Magic Lantern, I believe that to Messrs. Negretti and Zambra the honour is due of having first produced for public sale subjects of geographical and artistic interest, specially prepared for the lantern; but I am not aware that any one besides myself has entered upon this branch of trade with special Educational aims. I have long been impressed with the conviction that the lecturer on Botany, Zoology, Microscopy, Geology, Astronomy, and even on Pathology, would welcome as a boon truthful transcripts of nature that could be packed in a small space, and then shown on a scale to arrest attention in the student. This idea is actuated by no showman's feeling; for all persons who have had any experience in scientific educational matters know the value of appealing to the eye. Book knowledge, or that experience gained even from the most graphic descriptions, is of little value to the student who would become a true naturalist. He must see—if possible, handle—the objects of his study. The next best thing to this is to be familiar with the most accurate delineations of the forms he wishes to become acquainted with; and here photography offers her aid, and the magic lantern popularises her efforts.

But the Naturalist is not the only favoured teacher: the Art-professor may likewise avail himself of these aids to education, and so may the teacher of literature. In high-pressure steam days like these, the student has enough to do to make himself familiar with all that he is expected to be acquainted with; and if he really meets all the requirements of the Board of Education Examiners, he ought to rank as the eighth wonder of the world. But, by the aid of Photography and the Magic Lantern (would that some more scientific, if not so familiar, a name for our instrument were recognised), teachers could kill two birds with one stone; for, while they were familiariaing their pupils with the peculiarities of style of eminent artists, they might simultaneously convey to them the leading features in the works of celebrated authors such artists had illustrated. Thus I shall presently show on the screen how Kaulbach's wonderful style and Goethe's bitter satire may be illustrated by the photographic illustrations to "Reynard the Fox." Again, how Hogarth and morality may be combined, in the counterparts of the celebrated engravings of the "Good and Idle Apprentices;" and how the great stories of the Bible may be illustrated simultaneously with dissertations on the bold and vigorous designs of Schnorr. I will also show how the singing-master may avail himself of our method, so as to place the words and music of a hymn, or other appropriate song, before a choir, when such subjects as Schnorr's Bible Pictures are being exhibited in the dark.

And now to the means by which we accomplish our purpose. In the first place, the negatives may be those of the usual character; but, if taken expressly for the lantern, it should be borne in mind that the pictures should be included within circles. Whenever it is possible the negatives should be taken from nature, animate or inanimate; but there are many cases where this is impossible, and when a diagramatic treatment of the subject is desirable. This specially holds good with many Oceanic forms of life; for, when out of a sufficient bulk of their native element, they collapse and look anything but "from the life."

Again, from the rarity of the subject desired, it may be necessary to resort to engravings; but no expense should be spared to procure them from the works of the best authorities, and in such a style of execution as is to be found in the works of Ray and Palæontographical Societies. If artistic, the negatives should always be taken from the originals, so that the characteristic touch of the artist may be ensured. Where negatives of microscopic objects have to be secured, we must adopt one of several arrangements that are founded on a common principle.

Negatives of microscopic objects may be produced by the method originally proposed by the late Mr. Joseph Delves, which simply consists of placing an ordinary microscope (from which the eye-piece has been removed) in connexion with a solid or bellows-bodied camera, having a focussing range of from two to four feet, or a solar microscope arrangement, fitted to the window of a darkened room, the room itself being used as a camera, as preferred by Mr. Wenham, or my own arrangement, which conduces to compactness of parts, and the optical portions being always in adjustment when required for use; or the arrangement of Dr. Maddox, who replaces the reflecting mirror with an Abraham's achromatised rectangular prism, and employes a Coddington lens for the condenser; or the arrangement of the Rev. W. T. Kingsley, who employs a very complex system of condensers, an achromatic eye-piece of peculiar form, the oxy-hydrogen light, and determines the position of the chemical focus by means of a fluorescent screen. If low powers are to be employed, a microscopic plane mirror collects the light, and reflects it through the object-glass on to the sensitised collodion film, as shown in fig. 1. If, however, the higher powers are to be used, it is sometimes preferable to collect the sun's rays by a long plane mirror, mounted with a rackwork rotating support, and adjusting screws, so that it can be made to follow the sun's course, and the light so collected is condensed on to the object either as parallel or convergent rays; in the latter instance by means of achromatic lenses having the same angular aperture as the microscopic object-glass in use, as in fig. 2. As, however, all microscopic object-glasses are "over corrected," it is necessary to adopt some method for bringing the chemical image into focus on the film, after the visual focus has been determined on the greyed glass screen, and this is effected by aid of a micrometer head working on a screw attached to the stage (the parts being "keep up to their work" by means of a strong spring), the difference between the chemical and visual foci being determined experimentally for each object-glass for a given distance between the object and film; or, if great precision is desirable, special correction must be made for every object, for Dr. Maddox has found that the medium in which the object is mounted, its thickness, and the thickness of the cover, all have to be allowed for in securing perfection in the negative.

Fig. 1.

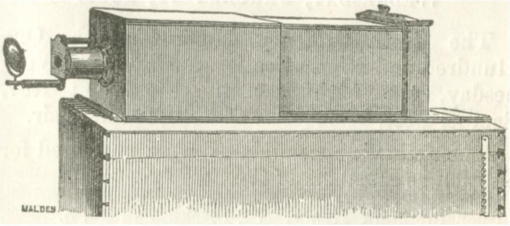
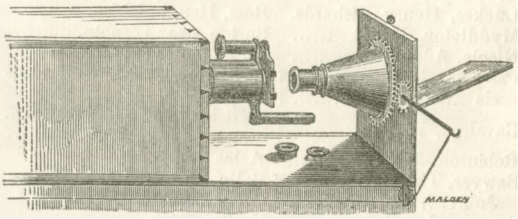


Fig. 2.



While, however, a considerable difference exists between the position of the chemical and visual foci in object glasses of low power, with the higher powers the difference is practically *nil.*

The great art in producing negatives of microscopic objects in the utmost perfection depends upon skill in the manipulation of the illuminating appliances, and I do not think anything has yet surpassed the photograph of Navicula angulata, produced in 1853 by the late Mr. Joseph Delves, a specimen of which (though, unfortunately, a faded one), is on the table. Negatives of microscopic objects may be produced by artificial sources of light, as the electric, oxy-hydrogen, camphine, napthalised gas, or photogenic pyrotechnic mixtures, as recommended by Wenham, and employed on a large scale by Moule.

As to the Production of the Positives, or Transparencies on Glass.—Following the system of the Microscopic Society, we ought to adopt a standard guage for our glasses, say three-and-a-half inches square for views for the general run of lanterns. The process—old structureless collodion, exposure in diffused light—the nearer it can be brought to a standard character the better. Iron development, after intensification with pyrogallic acid by Major Russell's process; fix with cyanide of potassium, varnish the picture to give transparency to the film, mount between two glasses; or the albumen process may be followed with advantage, especially for "superposition printing."

Where, however, lantern views are to be prepared for trade purposes, it is better to produce them by "Camera printing" from negatives of large size, for by this method the producer is enabled to supply views, larger or smaller than the standard size suggested, according to the special requirements of his customers, and greater definition or sharpness is likewise attainable. I have stated that the nearer we can bring the light employed for printing transparent positives to a standard character the better, for the operator would then attain to uniform results, and loss through failures would be greatly diminished. It is also desirable that the operator should be made independent of the sun's light, for after two season's experience I find that when the stock of views one has prepared during the summer months is carried off, at the time of demand, the winter months, through failing light, it is difficult, at times impossible, to meet the demand of would-be customers. To avoid this annoyance I have lately given my attention to the production of an artificial light, rich in actinic or photogenic rays, cheap in production, and that could be turned on or off as required, with what promise of success I will presently demonstrate.

It is true that we could use carbon points, or a fine stream of mercury, brought to a state of intense ignition by means of the electricity produced by forty Groves' cells, but both the ordinary electric light, and Way's mercurial electric light, are too costly in "the plant" to be economically considered. It is commonly believed and frequently stated in some of the photographic journals that the oxy-hydrogen light may be employed for photographic purposes, but the fact is, and I wish it to be distinctly understood, that though very brilliant and intense, it is peculiarly wanting in actinic rays. Sometime since my friend Mr. Charles Heisch was preparing a lecture on Photography, and wishing to give an illustration of the method of producing a picture, he thought he should be able to demonstrate the point by aid of the oxy-hydrogen light, but he found, experimentally, that while he could produce a sharp picture of a white bust, instantaneously, by the electric light, he could only obtain a dingy image of the same object after twenty minutes' exposure to the oxy-hydrogen light. It is well known that if an artificial light emits fluorescent rays (known by their peculiar effect on bodies possessed of the character called by physicists, "*Fluorescence*"), that light is also rich in actinic or photogenic rays. I shall now show how far the light I have been experimenting on is likely to prove of utility to photographers. [Mr. Highley here turned on from a gas-jet a bright violet sheet of flame that made an uranium glass brought into its presence glow like a gem.]

The cost of production is always a legitimate subject of discussion before this society, and I may therefore state that, taking into consideration the cost of production of negatives (our engraved plates, so to speak), the cost of making the existence of the subject known, in other words, the advertising charge, and the cost of producing the transparencies, photographic magic lantern views can be sold to the public for five shillings each, plain, and eight shillings and sixpence coloured, while the ordinary magic lantern pictures, which as I have previously stated cannot for one moment pretend to embody the same amount of detail or truthfulness of nature, sell at just double that price, that is to say, sixteen shillings coloured, if of the same size and pretensions to artistic exeellence, On the other hand, it should be stated that photographs involve a slight extra expense in the apparatus required, for an oxy-calcium or oxy-hydrogen light and achromatic lenses are essential for their perfect exhibition.

As ordinary magic-lantern pictures are in main made up of patches of colour, they can be shown by lenses that do not require great optical perfection; as, however, photographs are made up of detail, if they are shown with lenses that are not achromatic, a fringe of colour will be apparent on every line, and this defect in the optical parts of the apparatus used in their exhibition, will tend to produce a blurred effect, in fact a picture wanting in definition.

But photographic magic-lantern views, even when not in use, may be made available for educational purposes; for I would suggest that, if they represent Natural History subjects, instead of stowing them away in boxes, they should be placed in the open cases of museums, &c., beside allied objects, care being taken that they are fixed at such an angle that light should be reflected through them, by aid of a piece of white paper placed behind the transparency—or by mounting the views in long frames backed with fine ground glass, they might serve as appropriate borders to the windows of a scientific institution.

To make our system perfect, it behoves the producer of photographic lantern views to consult the requirements of the curator or travelling lecturer, and make the demonstrative apparatus as compact and generally useful as possible. I have therefore given thought to these important points, and now beg to call your attention to some of the contrivanees I have introduced.

THE SOURCES OF LIGHT may be the electric lamp, which, from its intensity, is well suited for institutions or large lecture theatres; but for ordinary use it is too expensive, as it cannot be worked to advantage with less than forty of Groves' cells, and these, with a lamp, cost not less than thirty pounds (without a lantern). Some lamps, such as Serrin's, cost, *per se*, twenty pounds, but at the International Exhibition I exhibited a novel form of automatic electric lamp, founded on a galvanometer arrangement, the invention of Dr. Squire, which, when perfected, will be quite as efficient as those of our French neighbours, Dubosq and Serrin, and cheaper through there being a simplification of parts. A model of this lamp is on the table.

For general purposes the oxy-hydrogen light is most efficient, and as the pure hydrogen formerly employed is now usually replaced by ordinary house gas, the trouble is greatly diminished. Undoubtedly pure hydrogen gives a better light than the carburetted form, and when house gas is not attainable it may be best produced from a leaden generator constructed on the principle of Doebereiner's lamp. The vessel being divided into two compartments, the lower part is filled with sulphuric acid and water till it runs out at the tap; the tap is then closed, and the acid mixture acting upon a cylinder of zinc supported on the outside of a tube connecting the upper with the lower chamber, causes hydrogen to be generated, which, having no vent, forces the liquid up the tube into the upper chamber; as soon as the acid is removed from contact with the zinc, the production of gas ceases. On the tap being turned, the liquid descends and forces out the hydrogen with considerable pressure. The acid in coming in contact with the zinc again causes the gas to be generated, and thus, if the apparatus is properly constructed, the hydrogen is supplied under pressure and as fast as it consumed (Fig. 3).

The hydrogen may also be generated in a glass Woulfe's bottle, and be stored in a gasometer or gas bag till wanted, or common house gas may be passed into either of these receptacles, and expelled under any given pressure by means of weights.

Oxygen gas is readily and safely prepared by placing a mixture of two parts of small crystals of chlorate of potash to one part coarsely ground oxide of manganese, into a conical copper retort, which is then closed with a cap or safety valve of vulcanised india-rubber tubing, and connected with the long tube of a wash bottle, for the purpose of freeing the gas from dusty particles or other impurities. The heat of a lamp is then applied, and as soon as the oxygen begins to issue from the short tube of the wash bottle, it is connected by a flexible tube with a wedge-shaped gas bag, as shown in Fig. 4, and so collected and stowed for use.

Fig. 3.

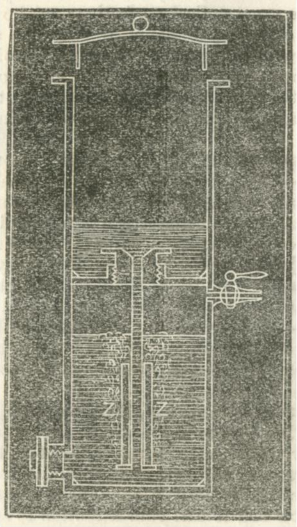
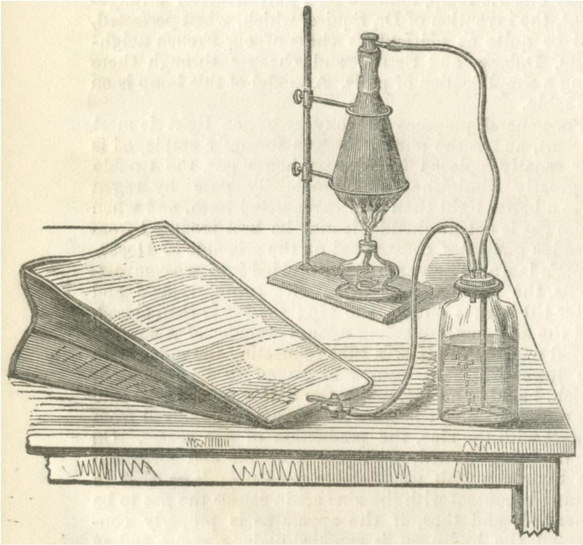


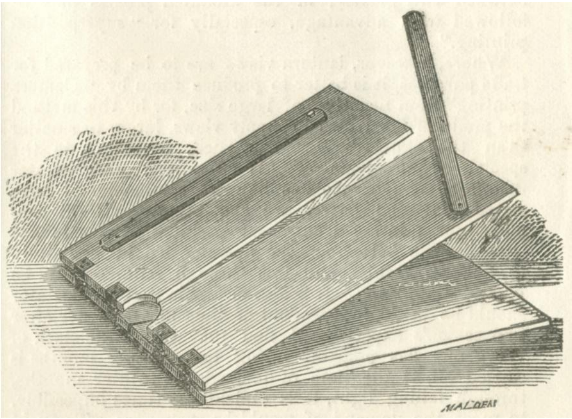
Fig. 4.



The bag of oxygen when wanted is placed between a pair of pressure boards; half-hundred weights are placed on the upper edge of the boards, and the gas is expelled at any desired amount of pressure.

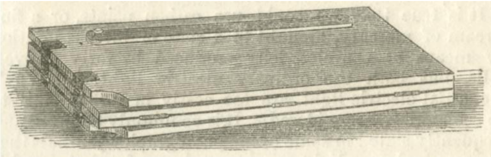
As the pressure boards, as ordinarily constructed, are of inconvenient size, I have adopted a suggestion of Mr. Malden, the engraver, a gentleman very conversant with philosophical instruments, and make them to fold up, so as to make packages of a more convenient form, the parts, when opened for use, being kept firm by clamps and swivel bars. The arrangement adopted will be readily understood by aid of Figs. 5 and 6.

Fig. 5.



PRESSURE BOARDS OPEN FOR USE.

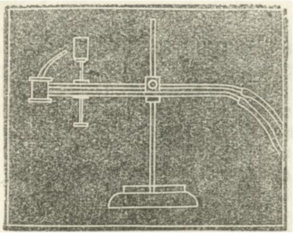
Fig. 6.



THE SAME FOLDED FOR TRAVELLING.

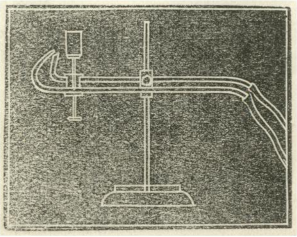
If both gases are to be used under pressure the connecting tubes of their respective bags are connected with the pipes of an oxy-hydrogen jet, Fig. 7, whence they are conveyed to a mixing chamber, from which the combined gases are projected upon a lime-ball placed at about one-eighth of an inch from the nozzle of the jet. The lime-ball is fixed upon a pin that is turned from time to time; or if the mixed gasses are to be used under greater pressure, the lime-ball is kept in constant rotation by means of clockwork, to prevent holes being burnt in the lime, and the light being thus thrown out of focus of the lenses, or the light being diminished in intensity through the distance between the jet and lime cylinder being increased beyond the proper point. The proper proportion of the oxygen to the hydrogen is regulated by stopcocks till the best effect is produced. If a picture only 10 feet in diameter is to be produced, a very simple arrangement may be employed, a fine jet of oxygen is forced from a bag under moderate pressure through a flame of house gas burning at the end of a brass pipe connected by a flexible tube with

Fig. 7.



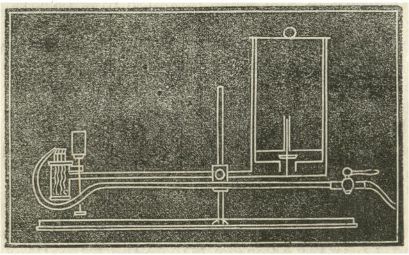
the burner of a lamp or other gas supply, Fig. 8, the mixed gases being projected on a lime cylinder, as in the previous arrangement, the incandescent lime being the real source of light.

Fig. 8.



When, however, house gas is not attainable, and the trouble of making pure hydrogen is an objection, a very good light may be obtained by forcing a fine jet of oxygen through a spirit flame on to a lime cylinder, by the arrangement shown in Fig. 9.

Fig. 9.

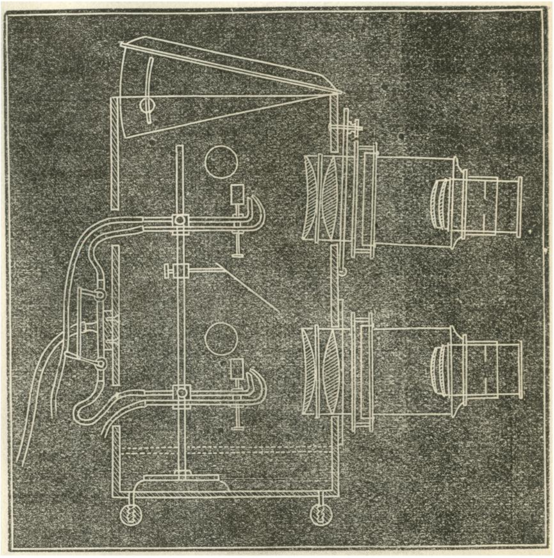


It should be stated that an argand oil lamp, even if the brilliancy of the light is increased by adding camphor to the oil, is not suitable for photographic views.

If the lime cylinders are to be subjected to a lengthened exposure, under great pressure, they must be made from the best and hardest lime; if under moderate pressure soft limes may be employed with advantage. Mr. Fryer, of Manchester, has proposed the employment of cylinders made of two parts of calcined magnesia to one part of sulphate of lime mixed with water, cast in a mould and then baked, which he states after careful photometric comparison, gives a light, as compared with ordinary limes, as 54 to 28; as far as I have tried this form of cylinder I cannot confirm this statement, but much may depend upon the details of preparation.

Lecturer's Demonstrating Lantern.—The best form of lantern for lecturers or institutions is one made in mahogany (the older the stuff of which it is constructed the better), twelve inches square and twenty inches high, fitted with two jets and two nozzles, the lower one being used for lantern views, the upper one is fixed on a hinged panel, so that if a dissolving view arrangement is desired, the two discs on the screen may be made to coincide by depressing the upper nozzle by the action of a spring and screw adjustment. The upper nozzle may be replaced by a microscope arrangement, or a polariscope, and to the flange of the lower nozzle various pieces, such as knife-edge slit plates may be fitted for Spectrum Analysis, or other optical experiments. To economise space and cost of production, in place of the ordinary chimney I use a flat dome of iron, fitted with side plates, so that by raising the dome or lid from behind, ventilation is secured, while the egress of light is prevented by the angular side-screens. Inside of the ordinary dissolving view fan, which I dispense with *in toto*, I make one view die away while the other brightens, by means of alternating gas-taps (that admit the oxygen supply), worked by a lever arm, all of which improvements are shown in section in Fig. 10.

Fig. 10.

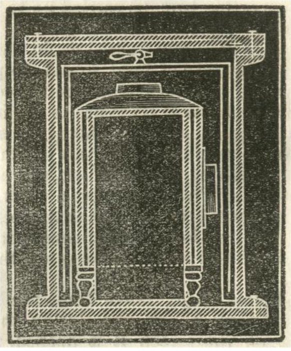


The optical parts consist of the condensers, which are formed of a meniscus and a crossed lens, and the front lenses, which should be achromatic combinations, adjustable by a tube sliding in a cloth-lined jacket, or by a rack and pinion motion.

The lenses should separate, so that while in combination they may give an obtused-angled dispersion to the rays of light, and then be used near a screen of moderate diameter, and when the back lens is removed, an acute-angled dispersion, so as to be suited for a large screen placed at a considerable distance from the lantern. By the latter arrangement, at an equal distance from the screen, a smaller, but consequently a brighter, picture is secured, as the same amount of light is not diffused over so large a surface as when the two combinations are used together.

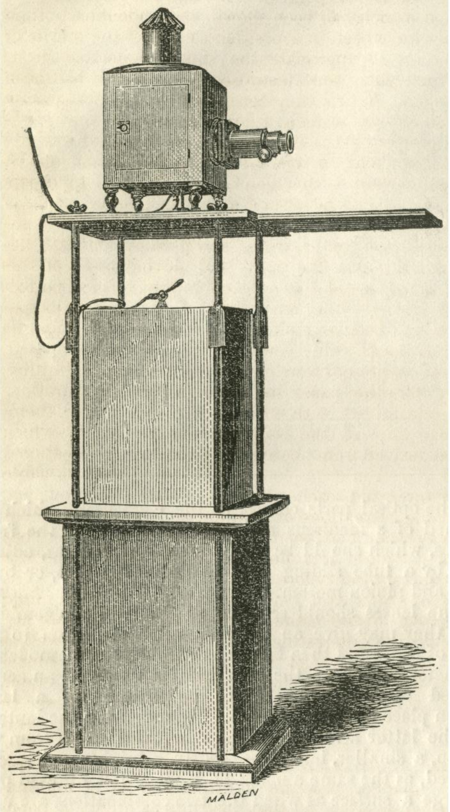
If this lantern is to be employed by a travelling lecturer, I would suggest the adoption of an arrangement I exhibited at the International Exhibition, and which stands upon the floor; it consists of a zinc gasometer, enclosed in a wooden casing; within the body of the bell, the lantern is packed, while a case containing the jets, nozzles, &c., fits within the body of the lantern, as shown in Fig. 11.

Fig. 11.



When the parts are unpacked four rods screw into the corner of the outer case of the gasometer, on to the top of these the folding lid clamps, and then forms a table for the lantern and slides as shown in Fig. 12, while the bell of the gasometer is capable of holding sufficient oxygen for an hour's lecture (or longer).

Fig. 12.



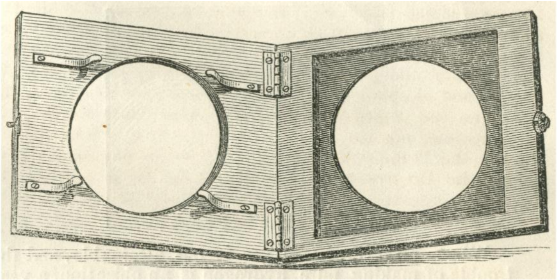
The lantern, case of fittings, and gasometer, when packed, occupy a space of 14 by 15 inches square by 24 inches in height. The four iron rods strap together as a separate package.

If, however, the lantern is to be in constant use at an Institution for demonstrations, pictorial or optical, then the lecture-room stand I have devised is more convenient. By rackwork and turn-table adjustments, the lantern placed on its stage can be centred with any piece of optical apparatus, or when required for views, it can, by a telescopic slide in the supporting bars, be carried up to the centre of a screen five or seven feet from the ground. By turning the folding flap back at any desired angle, and placing the lantern upon it, the rays of light might be projected upwards or downwards, as may be desired, according to the way the nozzle is placed in reference to the incline of the flap-table. I do not mount my photographs in separate frames, but, to economise space, pack them in grooved boxes like those used by photographers, and employ a pair of "view-holders." These open like a book, the slide is dropped into a square cell, and on the flap being shut and clamped by a turn-buckle of peculiar construction, the view is kept firm by four springs pressing on the corners, as shown in Fig. 13.

On a view-holder being taken from the lantern it is replaced by its fellow holder, and during the description of the subject on the screen it is opened, the previous slide removed from its cell, dropped into its groove in the stock-box, and replaced by the next subject, and the two view-holders are thus kept alternating.

With regard to screens, they may be transparent or opaque, the latter being distempered in "flatted" white by any method that prevents the surface from cracking when rolled up. Opaque screens can be made as large as ten feet in diameter, and up to this size may be conveniently mounted, like library maps, in cornice rollers. Beyond this size, they should be constructed of calico sheeting, as they then fold into a small space for the purposes of carriage, and when mounted may be strained by strong poles jointed together like a fishing rod. The smaller screens may be supported and strained on a portable folding stand I have designed, a model of which is placed on the table.

Fig. 13.



The advantages I claim, then, for magic lantern views over those in general use, when Educational value is aimed at, are delineations truthful to nature and abounding in detail, cheapness, compactness, as compared with paper diagrams, and their utility in museums, when not in use for their legitimate purpose.

Beyond the department I have specially dwelt upon this evening, I may say a few words upon the Educational value of Stereographs, but only a few words, for every one must have felt their value, but unfortunately they have never been published in a systematic form so as to give them a true value for the purposes of scientific instruction, but if systematically produced the Schoolmaster, the Provincial Lecturer, and the Professor of Natural History, might bring many unique specimens, scattered through the museums of the world, within the ken of their pupils; in fact, the treasures of our British Museum might be carried in a Professor's coat pocket. Such productions ought to be accompanied by descriptive letter-press, and this leads me to the application of photography to book illustration.

I was one of the first—I believe *the* first—who applied photography in this direction, for in 1852 I illustrated a paper in the "Quarterly Journal of Microscopical Science," of which periodical I was the projector, and (at that time) proprietor, with an 8vo. page plate containing two enlarged photographs of microscopical objects, with the "imprints" exactly in counterpart of a lithographic, steel, or copper-plate print.

These two subjects were printed at one operation, on a single 8vo. page of albumenised paper, in such a manner as to avoid the consumption of time and expence over the usual process of "mounting," a matter of great importance when a thousand copies had to be in the binder's hands on a given day. I subsequently published a second book illustrated with photographic plates, viz., an English edition of Dr. Unger's beautiful work on the restoration of the fossil Flora and Fauna of the different geological epochs, bearing the title, "Ideal Views of the Primitive World."

Having had some experience in this direction, I feel bound to state that we can never look to the present method of producing photographic prints, if we wish to apply the art to the purposes of book-illustration, for the cost of each print is too great for popular educational adaptation; but there is a method to which I look with hope, viz., the photo-galvanographic process of Mr. Paul Pretsch. By this invention, the counterpart of wood blocks can be produced from a photographic negative; and every publisher will, I think, back my assertion that this is the right and principle direction in which experiments should work; and I trust to see the day when Mr. Paul Pretsch's unwearied labours will, as they deserve to, be crowned with complete success. For every bee in the great hive of science should sympathise with the labours of his fellow bee, while deploring that the awards and honours of the land fall too often to the share of the drones. In conclusion, I would say that every Exploring Expedition should be accompanied by its official photographer; that every National Museum, Observatory, and Hospital should have its appointed operator; and then the hoped-for time may come, when we can, in systematic manner, place the Records of Scientific Travel, the Transcripts of Nature's Treasures, and the History of the Progress of fell Disease, upon the screens of our lecture theatres, the stereographs of our cabinets, and the pages of the books in our libraries.

DISCUSSION·

Mr. **Charles Jones**, as an old member of the Society, expressed the deep interest he felt in the subject which had been so ably brought before them this evening, and the pleasure with which he had listened to Mr. Highley's paper, and he congratulated the meeting upon the very practical manner in which that gentleman had treated the subject. Since the year 1859, he (Mr. Jones) had devoted a great deal of attention to photography in connection with the lantern, and the members would probably recollect that on two occasions at the Society's conversazioni he had exhibited a series of photographic transparencies in the lantern, showing its capabilities as an educational instrument. Amongst other subjects of a popular character, he had recently photographed the engravings given in the *Illustrated London News*, representing various incidents connected with the distress in Lancashire, and he should feel obliged to Mr. Highley if he would be kind enough to include a few of those photographs in the illustrations with which he was about to favour the meeting.

Mr. **Highley** said he should be most happy to do so.

The **Chairman** then suggested that he thought it would be more convenient that the illustrations should now be shown, and any further discussion upon the paper would take place afterwards.

Mr. **Highley** then exhibited, on a large screen, an extensive series of lantern views of scientific subjects, illustrative of the application of photography to the representation of geological, botanical, zoological, microscopical, astronomical, geographical, ethnological, biographical, and pathological subjects; and afterwards examples of the representations of the artistic works of Kaulbach, Schnorr, and Hogarth; together with groups of sculpture, as well as some specimens furnished by Mr. Charles Jones.

The **Chairman** said it was now his duty to recall the attention of the meeting to the subject which had been so ably brought forward in the paper, and to invite discussion upon it. After the illustrations they had just seen, he thought they would be better able to appreciate the paper which Mr. Highley had read.

Mr. **Pearsall** thought the medical profession and society at large would be greatly benefited by the application of photography to the illustration of the various stages of the diseases of the human frame. He had frequently been called upon to make sketches of the progress of disease, but it was impossible for an artist to follow the rapid changes which sometimes took place in cases of a complicated character. In this respect, therefore, photography was of the greatest value. Its importance to the palæontologist was also manifested in the illustrations given of the restorations of extinct animals. With regard to the illustrations of the distress in Lancashire, he thought it was a remarkable proof of the perfection to which the art of wood engraving had been brought, that the subjects exhibited this evening bear the severe test of the high magnifying power to which they had been subjected in the lantern.

Mr. W. **Hawes** thought so interesting a paper as this ought not to pass over without a few more observations than had already been made upon it; for he thought very few would have had an idea of the importance of this subject in an educational point of view, had they not seen the illustrations which had been shown, and undoubtedly they would not have been in a positien to discuss the merits of the paper, or to appreciate the views enunciated in it, without first seeing the illustrations by which it had been accompanied. When they considered that photography itself as an art was scarcely a dozen years old—that it was only just previous to the Exhibition of 1851 that it was first practically applied; it was a striking illustration of the marvellous rapidity with which knowledge of all kinds was made available, and how soon it became popular and was turned to really useful account. It was only by the untiring industry of comparatively few persons, who had devoted themselves to the study and development of this new art, that it could have been brought to such perfection as to allow of the production of such beautiful specimens as had been exhibited this evening. He thought their educational value could hardly be over-estimated, and that those present were much indebted to Mr. Highley, not only for the paper itself, but for the illustrations of this beautiful art with which he had favoured them, and which showed the vast amount of benefit which would be derived from photography applied to educational purposes. He could not conceive anything more valuable to the lecturer and teacher than this power of reproducing the marvellous creations of Nature, and exhibiting them in the way they had seen this evening. He therefore hoped they would unanimously thank Mr. Highley for bringing this subject before them.

The **Chairman** said, before they adjourned he might be permitted, in the name of the meeting, to thank Mr. Highley for the interesting paper he had read, as well as for the illustrations of it he had given. As an educationist, a line which he (the chairman) had himself taken, he could not thank him too highly for the manner in which he had brought the subject before them, connecting it as he had done immediately with education. The microscopic illustrations exhibited had shown, in a remarkable manner, how the valuable sources of information opened up to us by that instrument might be popularised and rendered available for general instruction. As an educationist, he (the Chairman), would again thank Mr. Highley most heartily, for he thought they had arrived, happily, at the day when they did not regard education as a mere matter of form. The eye must be entertained, and they might in many ways contribute to education and enlarge the powers and faculties of the mind without treading merely those old and narrow paths to which education had been hitherto confined. The rule of thumb was no longer admissible as a simple means by which alone education could be conveyed; and any means by which science could be popularised was to every educationist in 1863 the most valuable assistance that could be given. He therefore looked upon photography as a means, and a most important one, by which opportunity would be afforded of enlarging and educating the minds of the people. He now begged, in the name of the meeting, to thank Mr. Highley both for his paper and for his beautiful illustrations.

Mr. Charles Jones exhibited some transparent and other stereoscopic views, and Mr. J. R. Lavanchy sent for exhibition a selection of photographs consisting of cartes de visite portraits, and portraits of dogs and horses by J. Delton and Cie., of Paris.

The Secretary announced that on Wednesday evening next, the 21st instant, a paper by Mr.

A. K. Isbister, M.A., "On Colonization and Convict Labour in the Hudson's Bay Territories," would be read.

AWARDS OF MERIT AT INTERNATIONAL EXHIBITIONS.

(*Continued from page* 133.)

In August last the Council of the Society of Arts issued a letter, inviting the opinion of the Jurors, the Commissioners for the Colonies and for Foreign countries, and the principal Exhibitors at the International Exhibition, on the question of Awards of Merit in connection with International Exhibitions; and requesting replies to the questions given below, with the intention of embodying the answers in a public report.

AWARDS OF JURIES.

1.—Are you of opinion that Awards for Merit, by medals or otherwise, in International Exhibitions, are desirable?

2.—State the reasons for your opinion.

3.—Ought Works of Fine Art and Designs to be excluded from the awards?

4.—Can you suggest any better method than the appointment of jurors for making the awards?

5.—Can you suggest any improvement in the constitution or proceedings of the juries?

6.—Is any appeal from the decision of the juries desirable?

7.—If you think awards undesirable, can you suggest any other means by which meritorious productions may be brought to the notice of the public?

8.—Have you any further suggestions to offer on the subject?

The following is a summary of the replies received. The figures attached to the replies correspond with those of the questions*:—

Maclea and March, Exhibitors, Class VII.—1. No. 2. The general belief is that exhibitors who have friends or relatives in the jury, have a favourable influence beyond those who have not, and who simply send their products and pay no further attention in the matter. Besides, the parties who are to be the future purchasers of any commodity shown, are quite as good judges as the individuals who compose the jury, and are more interested in forming a correct and unbiassed judgment, and of considering all the points which ought to be considered, before giving a preference to any one. The only safe way is to leave the public at free liberty to examine and judge for themselves.

M. H. Marsh, M.P., Commissioner for Queensland. 1. Yes. 2. Exhibitors like them, particularly foreigners. 3. There may be much difficulty in deciding, when it must necessarily be a matter of taste. 4. No. 5. No. 6. No. The opinion of the public is enough. 8. Would suggest that the reasons given by the juries should be made more full and specific; the public would thus have better means of deciding.

George Maw, F.S.A., Exhibitor, Class XA.—1. The reasons are so conflicting it is difficult to give an unqualified reply; but, on the whole, believes that awards must be admitted as a necessary evil. 2. Awards of merit add greatly to the general popular interest of exhibitions, add to the prestige of exhibitors, and, therefore, act as inducements to exhibit. Does not consider the awards of jurors, individually, of much value. Although the medals have generally been given to the best *fourth* of the objects exhibited, yet when a careful examination is made of any particular branch, it must be admitted they convey no particular significance. The impossibility of a sufficiently fine classification brings too great a diversity of objects under the notice of a single jury. Attempting to subclassify any particular class, so as to bring similar objects into relative consideration, presents the greatest difficulties; for instance, if the mere question of merit decides the awards, perhaps the whole of the medals available by a jury would be appropriated to a particular branch of manufacture which happens to be more fully represented in its class than another. Again, the different kinds of excellence, such as excellence of design, excellence of manufacture, novelty, or excellence of display, must always conflict in deciding the awards of a jury, and the unequal importance that different juries give to these various kinds of excellence must result in an apparent inconsistency. It is unwise to do away with all gradations in the character of awards. The award of a similar distinction to the best seven thousand objects places on a level those of widely different character, and must bring such awards into disrepute with many of the high class of exhibitors; thinks the "Council Medal," or some similar distinction, should be retained; that a rather larger proportion should be given than in 1851, say one to every four ordinary medals, or one to every 16 or 20 exhibitors. These would be distributed amongst the best thousand exhibitors who must care little for a lower award, which classifies them with their inferior competitors. Would propose that every object should be adjudicated upon under four distinct aspects, and an award made upon each separately. *a.* As to excellence of manufacture. *b.* As to excellence of design. *c.* As to originality or novelty. *d.* As to display in Exhibition. Qualification under any one aspect to be subject to the award of a medal, but only one medal to be given to the same object however many of the qualifications it may have passed, which would all be enumerated in expressing the award. In the recent report of awards these terms of qualification are all used, but to systematise them and make them uniform in the several classes would tend greatly to simplify the work of the jurors, and give a greater apparent consistency in their awards. *e.* Would limit the awards altogether to novel inventions or new applications of old processes. *f.* Would award the medals upon a fixed schedule competitive prizes offered in all the leading branches of industry, similar to the awards made at the Royal Agricultural and Horticultural Societies' exhibitions. 3. Awards should be limited to the industrial department of the exhibition, as awards to objects of high art would not be appreciated by exhibitors, and it would be impossible to make them on any definite system. 4. No. 5. Considers the present constitution of juries excellent, and everything that can be desired. 6. It would be found desirable to permit an appeal from the jurors' decisions, more with the object of satisfying unsuccessful competitors by the knowledge that an appeal is open to them, than with the idea that it will be often taken advantage of. Appeals, if admitted, should be made in as formal and systematic a manner as possible, on some distinct grounds, to be classified in a formal schedule by the commissioners. Awards, and the exact way in which they are expressed, should be made known privately to exhibitors before publication, to give them an opportunity of correcting clerical errors or errors of description and designation. A comparison of the first and second editions of the jurors' awards, 1862, will show the necessity of this. Is inclined to think that a mere difference of opinion between an exhibitor and the jury of his class should not be considered a sufficient ground of appeal, but an appeal on such points as, alleged insufficient tests of merit, clerical errors, errors of designation, &c., should be allowed. 8. In the 1862 Exhibition numbers of exhibitors have been allotted space in different classes for the very same objects; it should be insisted on that every applicant for space in a particular class should state whether he has applied for space in any other class, and if it is found the several applications are for similar objects, he should be referred to the general superintendent of class committees, who would decide which of the applications should be cancelled. Much valuable space in the 1862 Exhibition has been wasted by duplicate sets of articles being exhibited in different classes, with the object of getting separate awards. Architectural pottery, sanitary ware, &c., should be made a sub-class of pottery, instead of being placed with civil engineering.

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* In Mr. Lavanchy's answer to question 1, p. 131, col. 2, line 34 from bottom, for "No," read "Yes."—Ed. *J. S. A.*

John Mercer, F.R.S., F.C.S., Juror, Class XXIII.—1. No. 2. There is such equality in the articles that the jurors are often unable to determine which are the best and deserving of medals, but, as they are expected to give a proportionate quantity, their friends and acquaintances that may be supposed to have had an influence. 3. No; if medals are given at all, they are to be given for merit and excellence; but the jurors, finding such difficulty in determining which, above others, is the best, a friend in such cases has influence. 4. No. 5. No; in general they do their best, but in cases of such equality private friendship has considerable influence. 6. No; it would open a field for competition and contention which would fill the Exhibition with confusion, for to get a medal is looked on in a money value point of view, and used as such in the sale of the article. 7. Favourable mention—" Good," or " Excellent," is enough; too much would be improperly used.

George Mitchell, Exhibitor, Class Xc.—1. Not under the present arrangements. 2. *a.* Medals can be bought indirectly. *b.* The gentlemen of the juries award medals to those who are customers, &c. *c.* Some of the jury have awarded themselves medals for their drawings, and those who executed the objects, for instance, see Class Xc., No. 2,427, no medal—No. 2,440 has a medal;—contrast the two. *d.* The man of genius is excluded, often because he has used all his means; then comes the agent, and receives the honour. 3, 4, and 5. Certainly not, as it is a gift of nature, which is cultivated by indomitable energy. There are a great number of noblemen of shrewd and impartial judgment, and gentlemen who have made their fortunes by their skill and tact, and retired; these two classes of men would be the men, in my opinion, to award the right men according to their merits. 6. Yes; but the time would be thrown away, as it would not be noticed. 8. If the awards had been left in the hands of the Commissioners and their superintendents, it would have given greater satisfaction than the present arrangements.

P. Möller, Sweden, Juror, Class IIIA. — 1. The answer of this question depends upon the understanding of the expression " but voulu," intended purpose. *a.* If by this is to be understood (as the question 7 seems to indicate) a public and honourable distinction of the most remarkable products at the international exhibitions, neither the medals nor the way in which they are awarded have fulfilled this purpose. *b.* But considering that the Council of Chairmen at the International Exhibition of 1862, by removing all gradations of medals and by pronouncing that medals are to be awarded for merit, without any distinction of degree, and without reference to competition between producers, have acted in a just and liberal way by also acknowledging that every kind of art and industry possesses a real and absolute value; and, as the medals distributed at the London Exhibition of 1862 were intended as rewards to producers who had shown, by their exhibits, that their products were excellent in their kind, I dare to answer the question in the affirmative. 2. The most remarkable products have not been rewarded, only products excellent in their kind; and it would have been as difficult as unjust to have picked out amongst these, certain articles, and stamped them to be of a still superior merit. Where excellence exists, no pre-excellence can be admitted.. By not making any gradations in the rewards (highly commended is only an encouragement), the bronze medal rises to the same value as a gold medal, and becomes, what it ought to be, a " medaille d'honneur." As such it has been received by the producers in my country. 3. No; the fine arts have already shown so great an influence on the development of industry, that beauty in form and taste in adorning are now, in many industrial branches, as much wanted and as indispensable as strength or utility; this will seem sufficient for not excluding the fine arts from the international exhibitions, even if they merely were to be considered as " expositions industrielles." 4. Every reward or public acknowledgment of merit which is to be considered as justly and well deserved, must be founded on a strict and accurate examination, and an impartial and conscientious judgment; I think an able and well composed jury to be best suitable for this purpose, and cannot construct any other industrial areopagus which will not, more or less, include the system of a jury. 5. The jurors have been nominated either by the governments or by the commissions of the different countries, and in some cases the commissions have been guided by the wishes or proposals of the exhibitors. More uniformity in the nominations of jurors ought to exist, and the nominations should be made in such a way as to ensure the jurors being members of an international and industrial court of justice, and not merely guards of the interests of their countrymen exhibitors. 6. Appeals from the decision of a jury for explanation to the council of chairmen ought not to be permitted, except in a case where the legalised and prescribed rules or formalities may be proved to have been omitted or misunderstood. If so, the case should be remitted to the jury. 7. However approving of the system in awarding premiums, adopted at the London Exhibition of this year, I propose, as a mode of making the public appreciate the most remarkable products, that the juries should add to their decisions more detailed notes or declarations about the rewarded articles, and especially about those which want such explanations in order to be fully understood and duly valued. 8. The time for the meeting of the jurors ought not, as this year, to be fixed immediately after the opening of the Exhibition, but to be postponed at least a month. It is known that the exhibits of several countries were neither arranged nor numbered, nor were the special catalogues, containing many articles not mentioned in the official, and several notices and explanations published before the lapse of that time. By this the jurors were detained and annoyed in their work, and, in some cases, obliged to hurry on to regain the lost time. It has happened that medals and honourable mentions, awarded by the jurors, have been omitted in the record of proceedings, and also that mistakes of lesser consequence have been made. To prevent this, it ought to be prescribed that the record of proceedings kept at the meetings of sections or classes should be read at the end of every meeting, and signed by the chairman and secretary. It ought also to be ruled that no awards were to be noted in the record if not decided in the presence of a certain number of jurors.

Wortley de la More, Commissioner for Turkey.—1. Oui. 2. Les récompenses honorifiques sont les seules qu'on puisse offrir avec avantage à l'industrie. Les petits industriels finissent toujours par en tirer un profit matériel. Les grands industriels y trouvent jouissance d'amour-propre, et ils ne craignent pas pour l'obtenir de faire des sacrifices d'argent qui font progresser l'industrie et tournent au profit de tous—de l'industrie en général, du commerce et des consommateurs, et de la richesse publique. Les récompenses honorifiques sont les seules qui puissent tenter la grande industrie. 3. Non. 4, 5. Non; mais la nomination du jury devrait être entourée de toutes les garanties possibles et de grande solemnité; et, s'il était possible, faire prêter serment devant Dieu et sur l'honneur aux membres du jury de ne juger que d'après la conviction de leur conscience et nullement sur la recommendation d'amis, &c., &c. Cela aurait peut-être pour résultat de diminuer le favoritisme qui est la plaie du jury tel qu'il est constitué maintenant. 6. Non; le jury doit être entouré de toute l'autorité et le respect possible.

Morewood and Rogers, Exhibitors, Class I.—1. From our experience we do *not* think that awards of merit by medals or otherwise in International Exhibitions are desirable. 2. Because it appears to us that those interested in particular branches of manufactures, and who are practically acquainted with them, take more pains in their investigations, and form more impartial and correct judgments as to the real and practical value of any new manufacture, than the jurors. 3. We think so. 4. No. 5. No. 6. No. 7. According to our experience the mere exhibition of articles in an International Exhibition, even though not publicly noticed in any other way whatever, is of great advantage, as the article exhibited attracts the attention of some practical men interested in that description of manufacture, and results in material benefit to the exhibitor, if there be real value in his new manufacture. 8. We have no further suggestion to offer except that we think that an International Exhibition of a more permanent character would be found of greater service to inventors than any awards.

James Morris, Commissioner for Mauritius.—1. In great International Exhibitions like those of 1851, 1855 (French), and 1862, medals are not the best means as rewards for merit; my reasons are the following. 2. In the first place, I beg to distinguish between Exhibitions; for what would be fit and proper as a reward of merit in a particular and special institution, as the Society of Arts for instance, would not be equally so in a universal exhibition, or representation of the *ensemble* of the genius, inventions, and industrial appliances of all nations. In the former, the exhibional element, either artistic, mechanical, or otherwise, is more individual than collective, and honour would be the grand aim of the exhibitor in most instances; in the latter, the commercial element predominating, it would be in a considerable degree subordinate to the mere feeling of honour, and introduce a feeling of profit and commercial notoriety with all its advantages. For the former, a medal is appropriate enough; for the latter, equally inappropriate, in my opinion. In special institutions, the means of rewarding merit, though large, are limited; one medal would therefore amply suit the aims of such institutions. But in an International Exhibition, where every grade and type of merit from the world at large is represented, if medals be given at all, they should be ordinated according to those various grades and types of merit; for it is illogical to give but one medal for such a vast variety of excellence as the present magnificent exhibition represents, as by this decision, the mere clever arranger is confounded with the most profound inventor, and *ad captandum* displays stand out in the same category of honourable appreciation as the greatest efforts of genius, the most elaborate productions of taste and skill, and the most useful and comprehensive appliances. A first and second medal, as in 1851, merely circumscribed but did not remedy this objection, and, moreover, led to great dissatisfaction. A single medal with an honourable mention, a subterfuge for a second medal, as in the present Exhibition, is equally a course of dissatisfaction, inasmuch as this demarcation of merit is too limited; but to apportion medals graduated *ad infinitum*, according to the various classes of merit, would be impossible and undesirable. For these reasons I consider, in so important and complex an instance as our present Exhibition, medals as awards for merit should not have been adopted. 3. Certainly not; one of the points of superiority of the present, over the former exhibition of 1851, consists in the splendid display of the works of Fine Art. As art is the great preceptor of nations, the most beautiful of all the links between the spiritual and the material, between intellect and nature, between man as a portion of the glorious material world and man as the representant of the Creator of the universe, towards whom his aspirations are continually ascending on the wings of art, be that art architecture, sculpture, painting, music, or poetry, to exclude from awards works of Fine Art and designs, would be to show a non-appreciation of one of the fairest domains of man's genius and intellect. For man does not live by locomotives and calculating machines alone; and the production of a Gibson, a Monti, a Millais, a Hart, a Maclise, *inter alios*, are as well worthy of the highest rewards as the most ingenious machine for the pleasurable milking of cows, or the most ambitiously arranged collection of children's toys. In fact, no distinction, so far as rewards and honours are concerned, can, or ought to be made between mechanical and artistic intellect, and the results, either useful or beautiful. They are each items, and items only, in the great whole of human power and genius, and ought not to be disassociated. 4. No. 5. The regulations and decisions regarding juries, as published by the Royal Commissioners, strike me as excellent in theory, but the results in practice do not appear to have been so satisfactory. This, I conceive, arose from too large a number of jurors and their associates, being in all 612 persons, 325 English, and 287 foreigners, without a sufficiently responsible head or chief, and consequently, without a sufficient unity of purpose and action. Had specifications, brief, but lucid, of the most important inventions, the newest combinations, &c., been furnished to the council of juries by the exhibitors themselves; and had each juror been furnished with a copy of such *resumé* appertaining to his speciality, I think many errors, and certainly many important omissions, might have been avoided. When I say "specifications," I do not mean a mere catalogue of the objects sent to the exhibition, but a summary of their points of usefulness, novelty, artistic combination, or otherwise, and the commercial advantages anticipated from them. Such a plan might have obviated any chance-work; it might also have prevented important objects from being passed over altogether, thus doing away with the necessity of explanatory remarks in prefaces to second editions of jury awards, or of the modifications therein made. 6. In reality such appeal would not be desirable; for to whom could such an appeal be made except to the general public, which, after all, will, by its approval, give the best and most lasting test of excellence. According to the constitution of the jury system of the Royal Commissioners, the possibility of such a thing as an appeal ought not to be. But circumstances have shown that some appeal, or at least some rectification of judgments given, would have been desirable. I consider that every objection might have been obviated had the awards not been made public until the Exhibition had much further advanced, or rather, until its conclusion. This would have afforded ample time and leisure for the rectification of errors, unavoidable, perhaps, but errors nevertheless. I do not see what other mechanism could be substituted for the jury scheme of the Royal Commissioners; a president of council, a special commissioner for juries, and the head juries, subdivided into sections, acting as a united body for the confirmation of awards. No better plan seems to me capable of being organised in order to insure accuracy and fairness. Had an appeal, according to restrictions laid down, been allowed, the president of the council, in my opinion, is the only person to whom such appeal could have been presented; had it been allowed, the errors of omission and commission might have been removed in the period elapsing between the first and second editions of the awards of jurors. The public would have applauded such a rectification; each exhibitor would have felt that full justice had been done to him; and, above all, it would have become clear that no acknowledged error had been allowed to remain uncorrected from any adherence to form or routine. 7. In place of awards, as represented by medals and honourable mentions, I consider a *report* from the aggregate body of jurors, carefully and conscientiously drawn up, far more valuable, both in a commercial and artistic point of view, as a full recognition of excellence. Such a report, or analysis, as it were, of the excellence, and a *resumé* of the progress of the arts and sciences, as represented in the Exhibition, would, in my opinion, be a stronger stimulus to improvement, and a juster appreciation of merit, even commercially speaking, than any medal or honourable mention could effect. For in such a report each exhibitor could see the reasons in detail for his favourable position, while at the same time he could compare with his own successful position, the equally successful position of the other exhibitors. The degree of merit could be at once ascertained, which no medal can specify, inasmuch as one party gaining a medal, who places it in his window on his goods, or otherwise, is *primâ facie* presumable to have had as much right to such a medal as the most eminent inventor whose exhibited objects have been the products of patient and laborious study, and their results of the greatest advantage to the whole human race. As an antithesis illustrative of this position, I would mention the Toy Trophy, and the Calculating Machine of Mr. Babbage, or the Telegraphic Printing Apparatus of Siemens and Halske, their Voltaic Induction Coils, &c. Besides, from such a report each exhibitor, honourably distinguished, could extract what applied to himself and publish it, as an incontrovertible proof of his excellence, in any way he pleased; this printed testimony of the jury, the *élite* of all most celebrated in each speciality, would be far more impressive and specific than any medal, and the correctness of the extract could at any time be verified by an inspection of the report. A copy of such report might be presented to the exhibitors, with any amount of formality, at the end of the Exhibition.

John Moseley and Son, Exhibitors, Class XXXIIb.—1. No. 2. Because the experiments have proved that it is difficult to elect qualified and impartial judges. 3. Not if awards are given at all. 4. If awards be given a better judgment may be obtained by electing one judge only in each class. Candidates for the office to be nominated by the exhibitors in the several classes, and the judge to be elected by exhibitors voting by ballot. 5. None occurs to us. 6. Yes; as at present constituted. 7. A critic might be elected by exhibitors in each class, who would be furnished by them with whatever information they might think desirable. He would then, shortly after the opening of the Exhibition, commence publishing the reports in a special daily penny paper to be published by the Commissioners, a portion of the reports from each reporter being inserted daily. The said paper being open to a limited extent to the correspondence of exhibitors. 8. It should be made known that the present awards are considered without value as criteria of merit. Would suggest the importance of the judge in each class being sworn to give the verdict according to the best of his judgment and belief. A ceremonial for the purpose of impressing the importance of their doing so would be desirable.

William Muir (William Muir and Co.), Exhibitors, Class VIIb.—1. Much more satisfactory both to exhibitors and, in the end, to the general public, that there be awards by medals or otherwise. 2. The object of exhibitors is mainly to call attention of the public to the special article of their manufacture, and thus to receive public recognition. In so doing they lay them before those who have a direct interest in the value of their productions, and who may be presumed to be the best judges of them. Articles left to the decision of the public and the purchasers are much more likely to have their real value recognised than by means of medals indiscriminately awarded by juries, no matter how constituted. This is the experience of almost all exhibitors in the exhibitions hitherto. Those of 1851-1855, and the present one of 1862, have given general dissatisfaction. 3. There ought to be no exceptions in favour of any article whatever. 4. Does not see how any different constitution of juries would obviate the difficulty. 5. Objection is to juries at all, but can suggest no better court of appeal than the general public. 7. Periodical exhibitions are desirable, and can suggest no better means whereby meritorious productions can be brought under public notice. Takes exception only to the indiscriminate awarding of medals or other prizes by juries who are often composed, and necessarily so, of men themselves exhibitors, rivals in trade or otherwise as successful inventors, manufacturers, and others *connected* with trade, who are very jealous of their dependents rising and gaining admission into their ranks. This, rightly or wrongly, is almost certain to give dissatisfaction; whilst the unbiassed judgment of the public, and of those who are in want of the article submitted, is all that is wished or sought for. The Patent Laws are a means to the same end, and might be made still more efficient were they so simplified as to bring them within the reach of, and secure to, the meritorious operatives especially, the fruits of their ingenuity and industry. 8. In the management and arrangement of the details of Exhibitions, care should be taken that they are left as much as possible in the hands of intending exhibitors, and that as little as possible of the official element be employed in connection with them.

Eliezer Nash (Butler, Nash, and Co.), Member of the Society of Arts. Is not an exhibitor.—1 and 2. Awards for merit are not desirable. *a.* Because they cannot stimulate to excellence in invention or manufacture, which are intrinsically the products of mind and persevering energy, the evolution of these qualities being a much greater stimulant than any extraneous excitement. *b.* Because awards of medals, &c., are invidious expressions of disapprobation of the products of a very large number of Exhibitors who should be considered to have done well, as no individual can contribute to the aggregate collection of a great International Exhibition without having incurred an expense and labour sufficient to guarantee integrity of purpose. *c.* Because the awards can only in a few cases be made in favour of the persons who alone have the legitimate right to them as being the inventors, designers, or makers of the works on which the award is made, for most of the exhibits are by the purchasers of such works. *d.* Because such awards are commonly applied to a puffing system of advertisement, tending to deceive and mislead the public, who accept the exposition of a jury's award as an indication of excellence. Gives an instance of this. *e.* The difficulties of obtaining competent and impartial jnrors so great that no standard of excellence can be based upon the awards. 3. Cannot see why works of fine art designs should be excluded; the reason No. 4 does not apply to such works with so much force as to general manufactures. 5. No exhibitor should be permitted to be juror, and the Commissioners of the present Exhibition appear also to think the same, as they have made every juror disqualified to receive a medal; but does not that disqualification, in connection with the greater honour of being selected as a juror, confer a greater reward upon such juror, with all its consequences, and the objections as above in reason No. 4. 6. An appeal from the decisions of juries not desirable, because such appeal could only only be made to umpires similarly selected, and would open up an endless discussion without satisfactory results. But thinks it would be well to allow juries to reconsider their decisions in cases of doubt and difficulty.

Newton and Company, Exhibitors, Class XIII.—1. Very undesirable. 2. Because it is simply impossible to decide on the merits of the majority of articles exhibited by merely looking at them, and, as a rule, they cannot be otherwise tested. There seems to have been no kind of principle on which they were awarded, sometimes the inventor, sometimes the manufacturer, and at others the retailer, getting a medal. 3. A more correct judgment could be arrived at on designs than in complicated machines. 4. Very difficult to get jurors who understand the subject, not connected in some way with the exhibitors. 5. Impossible for juries to come to anything like a correct judgment without seeing the exhibitor to explain. In many instances they were invited to do so; whilst other exhibitors in the same classes were not allowed even after requesting. 7 and 8. Perfectly satisfied to exhibit, and leave the public to be the judges; it is quite reward enough for an exhibitor to be allowed to display his articles if they are good. This would almost entirely do away with the present universal dissatisfaction, and would not deter one exhibitor from sending.

John A. Owen, Juror, Class XXVIb.—1. Yes. 2. It gives great impetus to excellence in inventions and workmanship, the universality of competition leads to the production of much good. 3. No reason for excluding them. 4. No. 5. As far as possible exhibitors ought to be equally represented, and should have a voice in the appointment of the jury. 6. Not if constituted as suggested in No. 5. The jury, being selected from men of experience and high standing, would always listen to respectful complaints, having the power of calling in an associate or expert in case of doubt, and this should be final. Dissatisfaction is sure to arise in many cases, and, if encouraged, would lead to endless trouble. 8. Suggests that each medal should represent a preference for the time being only. No medal of honourable distinction of anterior date should be placed by exhibitors in any case. Parties infringing these rules mislead the public, and should be subject to restraint. Jurors should receive a token indicating their sacrifice of competition and their services rendered.

Sir Thomas Phillips, Vice-President of the Society of Arts, Chairman of the Council, and Chairman of the Jury, Class XXXVI.—1. Yes. 2. If bestowed with judgment, they afford the appropriate recognition of valuable inventions, of excellence in design or workmanship, and of improvement in taste, or in the adaptation of means to ends in works of industry. They are also much desired by exhibitors; and serve to encourage the exhibition, and, what is more important, the production of works of a meritorious character. 3. Works of fine art should be excluded from, but industrial design should be included in, such awards. 4. No, provided care be taken to ensure the appointment of suitable persons. 5. Knows nothing of the proceedings of juries generally, but the jury on which the writer served caused notice of their visits to be given to the exhibitors, in order to afford them an opportunity of bringing under the notice of the jurors the merits of the articles they exhibited; they met from time to time to compare and record their impressions; and at the close of their proceedings their decisions were read over, and their awards signed by the chairman. In order to give value to the reports of the jury, the reporter should be named by the commissioners instead of being chosen by the jury, in order to ensure the selection of a person thoroughly conversant with the subjects to be considered by the jury. Where exhibitors do not manufacture, they ought to lay before the jury an explanation of the grounds on which they rest their claim to a reward. The jury should also define accurately the articles for which their rewards are given, and the description of merit intended to be rewarded. 6. The Council of Chairmen constitutes an appropriate tribunal for ensuring uniformity of action and settling the rules by which the proceedings of juries should be guided; but an appeal would not be desirable from the decisions of juries to another tribunal on the merits of the articles exhibited. Thinks that exhibitors should be made acquainted with the awards before they are submitted to the Council of Chairmen, and should be entitled to bring under the notice of the jury merit or excellence which appears to the exhibitor to have been overlooked, and thus afford to juries an opportunity to reconsider their decisions. 8. Improvements might have been made in classifying the articles exhibited, and care in this respect is essential to the satisfactory discharge of the duties of juries. Many articles were included in the class for which the writer served which were not intended for that class, and some of those proper to the class were included in other classes; and has reason to believe that from these circumstances some articles were not inspected by any jury.

Phillips and Co., Exhibitors, Class IIIb.—1. Very objectionable. 2. Because it gives undue advantage to the possessor of the medal, the public being ignorant of the reason why the medal was given, and because it is stated by the secretary of juries that "the medals do not represent comparative excellence or competition between individual exhibitors." 3. Yes; see No. 7. 4. No; see No. 7. 5. No; see No. 7. 6. Yes, because of the almost impossibility of juries having full information of all the circumstances connected with each exhibitor's productions. 7. Think juries should make a report on each exhibitor's productions; that the report should be open for the inspection of exhibitors for a certain time; and that each exhibitor should be invited to represent any circumstances in connection with his exhibit in which the jury appear deficient in knowledge or are acting under misapprehension, the jury then to revise their decisions before publication. This would ensure that each exhibitor's samples, &c., had been examined, notoriously not the case with the present exhibition.

(*To be continued.*)

Home Correspondence.

MR. HUNT'S PAPER ON MINES.

Sir,—I must beg your indulgence in order to correct a misapprehension which may exist with some of your readers, in consequence of certain expressions made use of by Mr. Hopkins in reference to my former communication. He says, "It is quite evident that Dr. Collyer thinks that there can be no other science to guide miners than that assumed by speculative geologists. His letter in the last *Journal* is a perfect specimen of the kind of mining knowledge acquired in the scientific schools. It is truly lamentable that so much valuable time and money should be wasted in listening to such strange and wild notions of the state of the earth as depicted in Dr. Collyer's letter. The idea that a crystalline compound is a proof of igneous origin, when it is known that that compound contains 20 per cent. of water chemically combined, is, to say the least of it, most unaccountable and diametrically opposed to the facts and the senses."

I have quoted this in *extenso*, in order to show how "strange and wild" has been the forced interpretation of my letter by Mr. Hopkins.

That all the mineral substances which compose the earth's crust do assume a crystalline form on cooling from the liquid to the solid state, is a fact so patent, that it seems an insult to common sense to repeat it. There is not a single exception in the whole mineral kingdom. Does Mr. Hopkins seriously intend to convey to the readers of a scientific journal, that all the granites, syenites, porphyries, the metamorphic series of rocks, quartz, fluor spar, rock crystal, limestone, chalk, marble, or even chloride of sodium, contain water chemically combined to the extent of 20 per cent.?

If not, what is the meaning of his language?

That the hypothesis advanced by me was "strange and wild"—in Mr. Hopkins's opinion—is not to be wondered at—for he actually refers to his own work "published upwards of twenty years ago, under the title of "The Connection of Geology and Terrestrial Magnetism, in which the practical science of mining as explained in connection with electro-magnetic actions." I must plead ignorance of its existence. Imagine a work published upwards of twenty years ago on the electro-magnetic action of mining. No subject with which we are acquainted has made such progressive strides within the last ten years as electro-magnetism—it is quite a new field of inquiry and research—even our present information is extremely limited. To thus refer your readers to such a purely speculative work on practical mining as indicated by the electro-magnetic currents of the earth, and that published twenty years ago! Would he like consulting the cosmogony of the Chaldeans and Egyptians during their early dynasties relative to the earth's structure.

The whole tenor of my communication was directly the reverse of that misconstrued by Mr. Hopkins. I directly stated, that no amount of scientific knowledge would of itself, except accompanied by practical information, be of essential service to the miner.

Yours, &c.,
ROBERT H. COLLYER, M.D., F.C.S.
Beta-house, 8, Alpha-road, January 12th, 1863.

THE JURY REPORTS.—EDUCATION AND CLASS XXXI.

SIR,—The purchasers of the volume of "Jury Reports" will probably be somewhat surprised to find, under the head "Class XXXI., Iron and General Hardware," a very elaborate and lengthy dissertation, not only upon the social condition of the labouring classes generally, but also on the whole subject of public education at home and abroad. Since the publication of these reports is undertaken by the Society of Arts, I know no other channel than its *Journal* through which I can so properly convey to the public the few words which seem to me to be necessary in reference to this remarkable document.

Let me at once say, to avoid misunderstanding, that the accident of my being the reporter of the jury of Class XXIX. (Educational Works and Appliances), has no connection whatever with the fact of my writing this letter. The report which I prepared for that class does not in any way come into competition with that of Mr. Alfred Tylor, the reporter of Class XXXI. It scarcely touches the same subject. It confines itself strictly to facts and figures respecting public education, and to those general conclusions which had the sanction of my colleagues. It does not propose to discuss the many topics of controversy which are treated in the report of Class XXXI., or even to express opinions on them. It is therefore simply as one of the general public interested in education, and not in any way as a rival reporter, that I desire to avail myself of your pages.

In that portion of the report of Class XXXI. which relates to public education, assertions are repeatedly made which amount in substance to this:—

1. That all Government interference with education is mischievous; and "that the whole of the money paid by the State is thrown away, there being no result for it."

2. That the whole of the present apparatus for primary instruction in England—training colleges, pupil-teachers, examinations, inspection, certificates, &c.—has utterly failed to do its work, and only tends to promote "sham teaching and sham learning."

3. That the only education worthy the name, is given in Sunday-schools, Mechanics' Institutions, and certain voluntary institutions, especially the King's College evening classes.

4. That the true solution of our educational difficulties will be, to leave the whole matter to the parents, who are the best judges of what their children want; and who would select better teachers and insist on better instructions if they were not meddled with and superseded by Government, school committees, and "educationists."

These propositions will be sufficiently startling to most persons who have studied, with any care, the state of popular instruction in our own country, or, indeed, in any civilised country in the world, during the last few years. Such persons will look with interest for the facts and arguments by which these propositions are sustained in a document which is to be published and circulated with an official character, which enjoys the combined sanction of the Jury of Iron and Hardware, the Royal Commissioners, and the Society of Arts, and of which it is expressly stated that:—"Arrangements have been made for the translation of this report by members of the jury. The names of translators, and the title and place of publication may be learnt by application to Messrs. Bell and Daldy." I will therefore venture to point out a few special examples of the way in which the great subject of National Education is treated in this report.

It is well known that the Royal Commissioners, in their report on Popular Education, recorded their conviction that the results of the present system were not entirely satisfactory. Their language is, "Only about one-fourth of the boys attain the highest class, and are considered by the inspectors to be successfully educated." This statement is qualified afterwards by another:—"Their religious and moral influence appears to be very great, much greater than even their intellectual influence. A set of good schools civilises a whole neighbourhood. The most important function of the schools is that which they best perform." Again, "the effort has been directed towards establishing a good type of education; towards the quality of the teaching rather than the number of the taught. In this point it has succeeded." [Report of the Commissioners, p. 273]. Throughout the whole report the strongest testimony is repeatedly borne to the great superiority of the inspected over the uninspected schools, and of the trained and certificated teachers over others. The fact that a large number of children quit even the best public schools before they can be pronounced to be "successfully educated," is accounted for partly by the early age at which the pupils are withdrawn from school altogether, partly by the frequent and capricious removals from school to school, and partly by certain defects and tendencies in the system for which the Commissioners suggest a remedy.

Now, it is curious to see the use which Mr. Tylor makes of the Commissioners' report. He is very anxious to prove that the whole system of school inspection, of government grants, and of training teachers has proved a failure. In criticising the schools under government inspection as distinguished from other elementary schools, he says, "The Commissioners' reports prove that only one child out of four gets an education." "The sum paid for each child at school is about 8d. per week throughout England. The sum actually paid by the fees is about 2d. per week, the difference of 6d. per week being made up from other sources, or, as only one child of four is properly taught, the payment is calculated for work done, then the parents (whose children are not taught) pay twopence each, and get little or nothing in return, and the successful child receives eight pennyworth of education for twopence. That is to say, for the teaching of each child, the parents pay only twopence, but if the number of children properly taught is made the divisor of the sum spent in the schools, then the dividend is 2s. 8d., which really represents the cost of the work done per week per child. The whole of the money (sixpence per week for each child in school), made up from other sources is lost, except that the children during school hours have been kept in a nice room during five or six hours a day, and out of their parents' way, and out of mischief."

Such is the interpretation put upon the Commissioners' statement. That statement is actually supposed to mean that three-quarters of the children are overlooked and permitted to remain idle, while one in four is selected to receive an education. Throughout the whole report the same curious hypothesis is assumed; and the "government system," as it is called, is everywhere contemptuously referred to by the writer as a "failure." But it is evident that the language of the Royal Commissioners affords not the smallest ground for such an assumption, and that even if true, it applies far less to the schools under government inspection, than to those voluntary and self-supporting schools for the poor, by which the reporter would like to supersede them.

Another example of mis-statement occurs in connection with evening schools. Mr. Tylor, like every other sincere lover of education, attaches great importance to these institutions, and desires to see them multiplied. But his dislike to the measures of the Committee of Council is so great as to betray him into making this statement :—

" Unfortunately, although in most cases the master of a day school teaches two or three hours in the evening, his class is confined to the two or three pupil-teachers he is paid by government for teaching, and the children sent early to labour have no admittance, except in a few cases, to evening schools, and must trust to private tuition, or the help of their neighbours, until they are of an age to attend Mechanics' Institutions."

The simple facts are:—1. That the Government does not, under the present law, pay masters at all for teaching pupil-teachers. 2. That it does make special arrangements for the instruction of those young persons as part of the evening-school work ; and, 3. That evening schools are expressly encouraged and provided for in the Code of Regulations, attendance being counted for them as for day pupils, and grants of money being obtainable in respect of all evening scholars who are able to give evidence of their having been well instructed. These facts might easily have been ascertained, and it is to be regretted that they have been not only overlooked but contradicted in this official report.

Here is another sentence which, by the mode in which it deals with opinions and assumptions as if they were facts, is very characteristic of the whole of the document from which it is taken :—

" It would be cheaper for working men to pay 8d. per week per child for education really suitable for what they require, and to have a master who would really attend to his duties, than to accept assistance, the value of which, as we have seen, is so much diminished by its unsuitability, and from the master being wholly independent of the parents."

If this sentence, as a comment on the existing elementary schools in England, means anything, it means this :—(*a*) That the education given in those schools is not suitable to the requirements of the working man's child, and would be so if the working man himself could control it. (*b*) That the teachers of such schools do not really attend to their duties. (*c*) That they are wholly independent of the parents. " We have seen," says the reporter, complacently, that these things are so ; but they are utterly unsupported by any evidence which I have been able to find, either in his report or elsewhere. As to what " *would be* cheaper," or better, we may all retain our own opinions ; but as to *what is*, it may be worth while to ask where these ideal schools of Mr. Tylor are, in which the education is more suited to the needs of the working classes, in which the teacher does his work more faithfully, and is in a closer and more natural relation to the parents, than in an average National or British School under a certificated master ? I have been studying schools, and in contact with teachers, all my life, and I can testify, from a wide experience of schoolmasters, who, having once been connected with self-supporting or voluntary schools, have afterwards obtained certificates, and been placed under Government inspection, that they have been stimulated to greater efforts, and that their work has become more thorough and systematic than before. As to their dependence on the parents of their scholars, it has remained neither more nor less than before ; for since in almost every school under inspection the teacher's income is regulated in some way by the number of scholars, he has every inducement to make his school popular, and to conciliate the good-will and confidence of the parents around him.

Again, " The system of pupil-teachers is bad ; for no one permits lads to teach boys even the most ordinary work of a factory ; it has always been held indispensable that boys and girls must be taught by grown-up persons, who have so much more power and influence if they are to be well taught."

If the system of pupil-teachers is bad, that which it has superseded—the monitorial system—was worse. The matter is simply one of expense. It is clearly impossible in schools for the poor to provide adult-teachers in sufficient numbers to give the individual instruction here said to be indispensable. The difference between the old Lancasterian schools and the existing uninspected schools on the one hand, and the schools under government inspection on the other, is, that in the former, monitors or mere children are employed ; and in the latter, the work is done by young people from thirteen to eighteen who are apprenticed to the principal teacher for the special purpose of learning the teachers' profession, and who are undergoing during the whole of their pupil-teachership a regular course of discipline and instruction for that purpose. How the withdrawal of government grants, by which alone the pupil-teacher system is supported, would facilitate the employment of older and better teachers, Mr. Tylor does not explain. Most persons believe that such a withdrawal would have exactly the opposite effect, and throw schools back again on the monitorial system.

On the training of public teachers for their work, the report has much to say. But the observations chiefly take the form of incidental references to the mischief of the existing system, the inefficiency of the training colleges, and the badness of the methods pursued in them. One or two specimens of the remarks on this subject may suffice. On the authority of some nameless professor in a training institution, it is stated that " about one in ten (of the pupils) turn out good students." Speaking of the Royal Commission, whose members, by the way, are described as " comparatively ignorant of the matters into which they were deputed to inquire," it is said, " their only conclusion should have been to advise the government to withdraw from interference as soon as possible ; and to impress upon towns the importance of establishing collegiate institutions in each centre of population, such as King's College. Large sums of money can be obtained from private sources for any good work of proved utility, and the opinion of the Commissioners would have had great influence in promoting the establishment of local colleges, while the training colleges for schoolmasters might have been dispensed with altogether in favour of superior institutions." And again, " Neither have they pointed out sufficiently the necessity of training teachers in open educational establishments where a scholarly education could be given them without boarding the students at all."

Many who read this report may not be aware that 39 training colleges are actually in existence ; these are, in fact, local institutions, reported by the Commissioners to be in a high state of efficiency, and adapted expressly for the professional education of schoolmasters and mistresses. With the exception of some six or seven of these, they have all been called into existence by the system of government grants. Mr. Tylor does not tell us how " the open educational establishments" which he would prefer should differ from these establishments, nor by whom they are to be supported, nor what class of persons would attend them, nor what would be the inducements held out to candidates for admission, nor how the fitness of such candidates should be tested and authenticated. Nor does it appear that any such local collegiate institutions as he desires are at present in existence. It is true that the King's College evening classes, which have evidently captivated the imagination of the reporter in a remarkable way, are mentioned with honour, over and over again, in the report. Now I have not a word to say in disparagement of that most wise and hopeful, though somewhat new, experiment. But it is certain that the instruction given in these classes is not designed expressly for teachers, nor adapted in any way to the requirements of their profession. The training and practice in the art and science of teaching, which are so important for the elementary schoolmaster, are not even included in the course of instruction at King's College. Clerks and shopmen, and a goodly number of thoughtful young men employed in London, find these classes helpful to them, in their efforts after self-improvement; but Mr. Tylor gives us no reason to believe that teachers, either public or private, have to any considerable extent availed themselves of the classes, or that the authorities of King's College ever specially contemplated the admission of this class of persons.

Yet the reporter says confidently, "Should there be local colleges established in our large towns, we might expect a great advance in the acquirements of schoolmasters generally, and a great extension of their influence. The limited number of men who have attended the classes for schoolmasters given in the evening at University College, and have subsequently taken their B A. degrees, have been most useful in raising the standard of qualification among their own class; *they have promoted a movement for forming a schoolmasters' association*, which in time may be the means of uniting schoolmasters into a powerful corporate body, giving diplomas and regulating the courses of instruction for their members, as in the case of the medical profession."

Mr. Tylor will not, I hope, think me obtrusive, if I respectfully ask him to give me the name of the association referred to in the passage which I have put in italics here. It cannot be the "College of Preceptors;" that is a society of the teachers of schools for the middle and upper classes exclusively; and was certainly not set on foot, or mainly promoted, by the persons described by Mr. Tylor. Nor can it be any one of the associations of elementary teachers. There are three of these in London, the Metropolitan Church Schoolmasters' Association, the British Teachers' Association, and the London Association of Teachers. All of them are sustained and managed almost exclusively by teachers holding government certificates of merit. Some six or eight of these teachers, perhaps, have, in addition to their certificates, obtained the degree of B.A., after attendance at the University College classes; but these gentlemen were not the founders, and are not the most prominent members of the Associations. Above all, no one of these three associations contemplates, or ever has contemplated, any such purpose as that ascribed to them in the report. They are simply societies for mutual improvement, and for reading and discussing papers on questions interesting to teachers. If Mr. Tylor refers to a body called the "United Association of Schoolmasters," the founders of which certainly did entertain hopes of realising the rather ambitious programme described by that gentleman, I must inform him first, that that association never exercised any one of the functions he ascribes to it; secondly, that its number of members was always very small; and thirdly, that it is now virtually defunct.

"Before the interference of government," says Mr. Tylor, "a great number of youths who had a capacity for teaching were trained by private gentlemen, and some of the most successful schoolmasters in London owe their education to the late Mr. Janson." Now, I have no right to question the first of these assertions, because I never heard of the private gentlemen referred to, nor of the "great number of youths" whom they trained. But it happens that I knew the late Mr. Janson very intimately, and that I remember well the kindly and intelligent interest which he took in the studies of a few young men. Of these, two were clerks in his own bank in London, two were artists, one or two have since distinguished themselves in other professions; and one,—I believe only one, is now a schoolmaster. He is the master of the school of which Mr. Tylor is the secretary, or "educationist." Mr. Tylor regards him, not unnaturally, but erroneously, as the type of a class. But in fact, I believe this gentleman will be as much astonished as Mr. Janson himself would be if he were alive, to find the hospitalities and the conversations of Stoke Newington, described after the lapse of nearly 20 years, as having afforded, in any sense, training and education for the schoomaster's profession.

There is a class of persons for whom the reporter can scarcely find censure too strong, but who, as being in every case voluntary and unpaid promoters of public education, might have been supposed entitled to his sympathy. He calls them "educationists," and says of them, "These persons, generally secretaries to school committees, unfortunately place themselves in a position above the master; they limit his power and influence, and stand between him and the parents of the children, and so prevent that progress which *would take* place" (the potential mood is constantly used in the report as if it represented a known fact), "were the schoolmaster looked to as the responsible person in the school, with whom alone the parents had to do." Then follows a long description of the relations between this "educationist" and the inspector, who, between them, are said to manage the whole machine, and to be completely independent of everybody else. All this implies that the managers of schools not under Government inspection exercise less control than others over the appointment of suitable teachers and over the studies of the school. This may be true, although in a large and varied experience of elementary schools I have not found it so; but if it be true, I doubt whether the benevolent supporters of schools which have not received Government aid will thank Mr. Tylor for the compliment. I leave "educationists" themselves, who have made large sacrifices of money and time to establish schools, and who have yet felt at liberty to welcome the aid afforded by the Government grants and inspection, to defend themselves against such imputations as this:—"Educationists now think that if the school-room is handsome, and the teachers can pass their examination, everything is done." "Gentlemen and schoolmasters take all the credit away from the parents, and throw dust in the eyes of the public on these points, making out that the credit is due to themselves."

I must not be supposed to speak here of the early part of the report, which relates to the social condition of the English artizan, and which apparently contains many valuable facts and much acute conjecture. But with regard to the portion devoted to education, I hope I may say, without discourtesy, that it seems to me to be a curious example of unwarranted generalisation, or of what Bacon calls the *inductio per enumerationem simplicem*. Exceptional facts, if they suit the theory of the writer, are treated throughout as if they were typical of great and general principles. Thus Mr. Tylor happens himself to be connected with a very flourishing and admirable institution in the heart of London, which in many circumstances of its history—in its unbroken career of usefulness during many years; in the possession of an excellent master who has a rare gift for teaching which makes him happily independent of all formal training; and I may add in the services of a remarkably zealous and intelligent committee and secretary, which render Government aid equally superfluous—is almost unique among schools. Yet the report, in many places, shows that Mr. Tylor regards it as the representative of a large class, and reasons from this one special example to his general propositions. So also he speaks with high and deserved honour of a gentleman at Hampstead, who for several years has devoted his evenings to the instruction of a few young men of the village; but he has not a word to say in approbation of the Examinations of the Society of Arts, or indeed of any of the great public movements by which adult education has been promoted on a large or national scale. In like manner a considerable space is given to a laudatory description of the Bradford Drawing School, because it was founded by gentlemen who sought to "teach the principles of art and their application to design, without connecting themselves in any way with the Government School Department."

Out of this has grown the "Designers' Art Association," of which Mr. Tylor strongly approves. It is true this association has fallen to pieces, or, to use the euphemistic language of the report, "is in abeyance for the present." Nevertheless it is to this one institution at Bradford that attention is directed, while of the Department of Science and Art, with its 87 drawing-schools and 12,412 scholars, no mention whatever is made. The quotations made from the Commissioners' Report are characterised by the same narrowness. It happens that out of a vast number of witnessess Dr. Temple was the only one who gave the sort of evidence which suited Mr. Tylor's views. Accordingly Dr. Temple is referred to repeatedly as a specimen of the *class of witnesses* whose evidence the Commissioners did not sufficiently regard. It would be easy to multiply examples, but these will, I hope, suffice to justify me in calling public attention to this report.

I must not be understood to complain here of the utterance of opinions hostile to that system of aid which is throughout the report called, somewhat erroneously, the "Government system of education." I have no interest in defending that system. I believe that much can be said against it, and that it is fairly open to criticism. Moreover, I think that we want the opinions of such men as Mr. Tylor on the subject. But I am sure that, although an *ex-parte* statement like his may be very valuable in the form of a review or a pamphlet, nothing should appear as part of a jury report which is not at least characterised by fairness and breadth of view, and which is not the result of large observation, careful induction, and the concurrence of experienced men. My complaint is simply this:—That Mr. Tylor's view of public education, which, however ingenious or even true, is certainly partial and one-sided, is not subjected to the usual ordeal of public discussion, but finds currency as part of a formal report on "Iron and General Hardware."

The members of the Society of Arts have recently had before them for discussion divers interesting questions propounded by the Council respecting the constitution and the work of Juries in connection with International Exhibitions. May I invite them also to consider the question, "What is the theory of a Jury Report?" I take it be this. A gentleman is elected by the jury to write a report on a given subject, because he is presumed to be specially conversant with that subject; and because, having the confidence of his fellow-jurors, he is likely to incorporate fairly into a general report the principal facts and conclusions which have been accepted by that body. Now, it is quite conceivable that many of the gentlemen so selected may be qualified to write admirable essays on other topics than that of their own special class; but how far it is right that such essays should go forth with the authority and *prestige* which belong to a jury report, is surely a question for grave discussion. Here is a document which is to enjoy exceptional advantage, and to be translated into several foreign languages; it is probably destined to be the only picture which many foreigners will receive of the state and prospects of popular education in England. Yet it is rather a polemical pamphlet than a report, and there is no evidence that its statements are sanctioned or would be approved by six practical men in England. I hope I may say this without detracting in any way from its value as a contribution to the honest and fearless discussion of a great subject, or from the ingenuity and skill with which its speculations are set forth.

One word more. The report is published at the request of the chairman of the "Iron and Hardware" jury, Dr. Von Steinbeis, from whom Mr. Tylor has obtained some interesting details respecting the state of public education in Würtemburg, and some strong testimony against the operation of the Government system of education there. That testimony will be better estimated in the light of the following quotation:—"I am glad to be able to give in Dr. Steinbeis's own words the result of the pay schools established in Würtemburg in connexion with the Board of Trade, of which he is a director, which is quite independent of the Board of Education." This gentleman, then, is, in his own country, opposed to the government system of education. He has the good fortune to meet in England with a member of the jury who holds similar views respecting the public education of England; and under their united auspices a report is produced which attacks and discredits not only the whole system of aid sanctioned by the state in this country, but also all the great religious and benevolent societies which have made education their special work, and almost all the elementary schools and teachers in the kingdom.

I am, &c., J. G. FITCH.

Denmark-hill.

Proceedings of Institutions.

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Croydon Literary and Scientific Institution.—The report presented at the annual meeting, held on Thursday, October 23, 1862, Edward Westall, Esq., M.D., in the chair, speaks of a year of prosperity to the institution. The society was formed for the purpose of "providing opportunities of acquiring sound and useful knowledge; of cultivating a taste for literature and science; and of promoting a friendly intercourse amongst the inhabitants of the town," by means of classes, a library, reading rooms, lectures and entertainments, &c. To apply the purely educational test in ascertaining the measure of usefulness of all institutions, appears to the committee to be a mistake. The work of class instruction is found to flourish most in the manufacturing districts and in the centres of commercial industry, and, as a rule, more in the northern than the southern counties. Croydon, a suburban town, does not rank with either of these classifications. Whilst the committee is fully alive to the importance of making direct educational movements (no season passing without some additional efforts being made in the way of class instruction); yet that this is the only important function of the institution, is not the interpretation of the committee. In the library, the reading rooms, and the lecture-hall, the report now presented furnishes ample evidence that there is a great appreciation of the benefits offered; and without placing too much stress upon direct educational results, it is surely a token of good, when the intellectual and recreative resources of the institution are so largely drawn upon by the inhabitants—and this, too, at so fractional a cost to each individual, that no one need be debarred on the ground of expense. The income for the year (including the balance brought forward) is £961 6s. 11d., being the largest ever attained, and this, too, when the item of fees for the hire of the hall is so much less. The balance in the hands of the treasurer is £108 6s. 6½d., of which amount the sum of £67 is carried forward as due to the current year, for unexpired terms of membership; so that the overplus, after meeting all expenditures and liabilities, is £41 6s. 6½d. It is proposed to carry £30 of this amount to the public hall fund of the Institution, for further investment in shares. There is still another amount, £58 19s. 5d., arising from dividends on shares in the public hall, and interest, which is not included in the above statement of income, but which is carried to the public hall fund of the Institution. It is thus seen that the total receipts of the Institution for the year exceed £1,000—a point of prosperity which, at the opening of the new building, it was hoped would some day be attained, but which the most sanguine would scarcely have predicted to be realized on issuing the second annual report from that time. The number of members enrolled during the year has been, first quarter, 813; second quarter, 807; third quarter, 781; fourth quarter, 663; average number per quarter, 766; but as many of these are double tickets, it is shown that no less than 947 persons are admissible to the lectures, &c. Although the average number of members is somewhat less than the previous year, yet more double tickets have been issued, so that whilst in 1860-61—921 stand registered as entitled to attend the lectures, &c., in 1861-62 the number is increased to 947. There is still a marked decrease in the number of members for the fourth quarter; and although additional attraction was offered in a fête given at Addiscombe, yet but a slight improvement in the number took place in comparison with previous years. The committee cannot enforce too strongly the importance of members being annual subscribers, as greatly conducing to the stability of the Institution; in addition, too, such a mode of payment, with second and third class members proves advantageous to the member himself. During the past year 370 volumes have been added to the library; 220 were bought, at an expense of £31 7s. 8d. to the funds of the Institution, and 74 vols. were purchased with donations of money, amounting to £13 9s. 6d., liberally given for the purpose; in addition to which 76 volumes have been kindly presented. The sum of £51 has been expended in the purchase and re-binding of books, and this large sum is not likely to be lessened in future years should the present demand for books be sustained. No less than 522 of the members have used the library during the past year, and the following shows the quarterly issue of books:—October to December, 1861, 2,829 vols.; January to March, 1862, 3,203 vols.; April to June, 1862, 2,736 vols.; July to September, 1862, 2,117 vols.; total issue for the year, 10,885 vols. The lecture season has again been one of success. Thirty-two lectures and entertainments have been given, with an average attendance of 612, and this exclusive of the fête at Addiscombe. On one occasion no less than 1,080 were in the hall, which is not unfrequently too small for the accommodation required. The following is the list of lectures, &c., for the past season:—The Misses Terry, entertainment; Mr. Rowton, lecture on "Ancient Minstrelsy;" Mr. E. Wheeler, lecture on "Voltaic Electricity;" Mr. Basil Young, entertainment; Dr. Letheby, lecture on "Chemical Magic;" Mr. J. T. Topham, lecture on "Dr. Johnson;" Dr. Daniel, lecture on "Napoleon;" Mr. F. Chatterton, harp entertainment; Miss Grace Egerton, entertainment; Rev. H. S. Brown, lecture on "The People's Proverbs;" Dr. Daniel, second lecture on "Napoleon;" Mr. J. H. Pepper, lecture on "Chemistry;" Orpheus Glee Union, musical entertainment; Mr. E. Yates, lecture on "Modern Society;" Mr. Geo. Grossmith, lecture on "Humorous Characteristics;" Mrs. Balfour, lecture on "England in the Sixteenth Century;" Robert Hunt, F.R.S., lecture on "The International Exhibition;" London Glee and Madrigal Union, concert; Dr. Macgowan, lecture on "China;" Rev. A. Mursell, lecture on "The Maid of Orleans;" Mr. and Madame Penna, musical entertainment;" Dr. Lankester, lecture on "The Sea-shore;" the fête at Addiscombe; a concert, vocal and instrumental. The committee most cordially thanked the following gentlemen, who have kindly helped our Institution by giving lectures gratuitously:—Rev. J. Baldwin Brown, lecture on "Alfred the Great;" Mr. A. K. Abbott, lecture on "The Glaciers of the Alps;" Mr. E. Wheeler, lecture on "Animals," &c.; Mr. F. I. Scudamore, lecture on "People we have never met," and lecture on "Post-office Savings Banks;" the Venerable Archdeacon Robinson, lecture on "Hebrew Poetry;" Rev. F. Greeves, lecture on "England in the Olden Times;" Mr. T. E. Crispe, lecture on "Thackeray;" Mr. W. A. Curr, lecture on "The Tower of London." The Singing Classes are conducted under the superintendence of Mr. Budd, whose heart is in the work, and who devotes much of his time to the instruction of his pupils. It is not enough to say that the Croydon Choral Society of the Institution has yielded instruction and pure social pleasure and delight to her members, but she has done much more, by aiding in any good work in which her services could be rendered. The Institution has had her hearty co-operation on more than one occasion, so that in creating a good we have got good in return. The Society have helped other funds in the town; and the last striking instance of usefulness, is that in which, by her own unaided effort, no less a sum than £25 7s. 2d. was realised for the relief of the distressed operatives in the manufacturing districts. A Drawing Class is now conducted by Mr. H. W. S. Edwards; and Mr. R. B. Paull has undertaken to conduct Arithmetic Classes, provided several members are willing to join. The committee earnestly hope that these classes may receive full support from the members—so palpable and important a means of imparting instruction is the best work in which the Institution can be engaged; and it should be here remarked, that if a sufficient number of members should at any time express a desire to the secretary to unite in the formation of a new class which is compatible with the objects of the Institution, such desire will at all times meet with the hearty encouragement of your committee. The committee are gratified to report that the attendance at the reading-rooms has been much greater than during the previous year. The committee, in conclusion, report upon that which is one of the most important features in their present prosperity, namely, the Public Hall Fund of the Institution. The number of shares has, during the past year, been increased from 1,492 to 1,700. Two gentlemen have, during the past year, exchanged their shares for life memberships, and Mr. Thomas Farley has liberally presented his shares to the Institution. The committee would be glad to see this example followed by others, so that, by gradually obtaining possession of the shares, the hall may ultimately become the property of the Institution. To promote this desirable end, the committee lose no opportunity of purchasing shares whenever their funds enable them to do so.

MEETINGS FOR THE ENSUING WEEK.

MON. ...Medical, 8½. Dr. Richardson, "Alcoholic Phthisis."
Royal Inst., 2. Special Meeting of Members.
R. United Service Inst., 8½. Mr. S. Barrass, "Proposed Plan for a wholly Iron-made Armour-plated Vessel."
R. Asiatic, 3.
TUES. ...Civil Engineers, 8. Discussion on Mr. W. H. Preece's Paper, "On Railway Telegraphs, and the application of Electricity to the Signalling and Working of Trains."
Statistical, 8. Dr. Leone Levi, "On the Cotton Trade and Manufacture, as affected by the Civil War in America."
Pathological, 8.
Ethnological, 8. 1. Col. Phayre, "On the Nations and Tribes inhabiting British Birmah." 2. "On the Jews of Aden," by a Native Jew of Aden, communicated by S. H. Bronkhorst.
Royal Inst., 3. Professor Marshall, F.R.S., "On Animal Mechanics."
WED. ...Meteorological, 7.
Society of Arts, 8. Mr. A. K. Isbister, "On Colonisation and Convict Labour in the Hudson's Bay Territories."
Geological, 8.
London Inst., 7.
R. Soc. Literature, 4½.
THURS...Royal, 8½.
Antiquaries, 8½.
R. Soc. Club, 6.
Royal Inst., 3. Prof. Frankland, F.R.S., "On Chemical Affinity."
FRI.......Royal Inst., 8. Professor Tyndall, F.R.S., "On Radiation through the Earth's Atmosphere."
SAT.......R. Botanic, 3¾.
Royal Inst., 3. W. S. Savory, Esq., F.R.S., "On Life and Death."

PATENT LAW AMENDMENT ACT.

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APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, January 2nd*, 1863.]

Dated 23rd December, 1862.

3425. J. Patterson, Beverley, Yorkshire—Imp. in machinery or apparatus for grinding, crushing, cutting, cleaning, and hulling or shelling various kinds of farm or vegetable produce, also applicable to the crushing or grinding of minerals and other substances.

3426. E. B. Wilson, Parliament-street, Westminster—Imp. in apparatus to be employed in the manufacture of malleable iron and steel.
3427. G. Haseltine, 12, Southampton-buildings, Chancery-lane—Imp. in the mode of, and apparatus for, converting petroleum or coal oil into gas for lighting and heating, the said improvements being especially applicable to lamps and stoves. (A com.)
3429. S. Russell, 27, Shaftesbury-crescent, Pimlico—Imp. in stereoscopes.

Dated 24*th December*, 1862.

3430. T. C. Hinde, Cardiff—Imp. in furnaces or apparatus for generating carbonic oxide.
3432. G. H. Birkbeck, 34, Southampton-buildings, Chancery-lane—Imp. in instruments for surveying and levelling. (A com.)
3434. F. N. Gisborne, 3, Adelaide-place, London-bridge—Imp. in the means for indicating the speed of ships at sea.
3440. H. Twelvetrees, Bromley, Middlesex—Imp. in washing machines.
3442. R. Lakin, Ardwick, Manchester, and J. Wain, Manchester—Imp. in machines for spinning and for doubling cotton and other fibrous materials.
3444. J. Taylor, Stalybridge, Cheshire—Imp. in engines for carding cotton and other fibrous materials.
3446. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in apparatus for stamping or marking paper and other materials. (A com.)
3450. C. J. Denton, New Broad-street—An imp. in the process of revivifying animal charcoal.

[*From Gazette, January* 9*th*, 1863.]

Dated 12*th September*, 1862.

2520. G. Bedson, Manchester—Imp. in rolling wire and other rods or bars of metal.

Dated 14*th November*, 1862.

3070. H. Morgan and J. Parkinson, Liverpool—Imp. applicable to weighing machines, part of which may be used to measure liquids.

Dated 15*th November*, 1862.

3077. A. Illingworth and H. Illingworth, Bradford—Imp. in washing wool and other fibres.

Dated 18*th November*, 1862.

3096. E. P. Houghton, Liverpool—An improved method of applying breaks or apparatus for stopping or retarding railway carriages.

Dated 5*th December*, 1862.

3266. P. Cowan, Hammersmith Bridge Soap Works, Barnes, Surrey—An improved method of purifying gas.

Dated 6*th December*, 1862.

3270. H. A. Bonneville, Paris—Imp. in the manufacture of stockings and socks. (A com.)
3280. J. Joce, Colchester, Essex—An improved composition or compositions for producing artificial sea water, or the odour or effects of sea water.

Dated 10*th December*, 1862.

3308. L. A. Lesage, 2, Rue Sainte-Appoline, Paris—An improved method of preparing jellies and jams.

Dated 15*th December*, 1862.

3350. M. Hyams, 55, Bath-street, City-road—Imp. in the manufacture of cigars, cheroots, and cigarettes, and in the treatment of tobacco.

Dated 17*th December*, 1862.

3375. F. De Wylde, Great College-street, Camden-town—Improved means for the protection and preservation of lead surfaces exposed to the action of water, and for the protection of such surfaces from decomposition by atmospheric action. (A com.)
3376. L. Latter, Leigh, near Tunbridge, Kent—Imp. in ploughs.

Dated 18*th December*, 1862.

3392. S. C. Lister, Manningham, Yorkshire—Imp. in preparing, combing, and spinning flax, silk, and other fibrous material.

Dated 24*th December*, 1862.

3448. A. V. Newton, 66, Chancery-lane—An improved construction of skate. (A com.)

Dated 26*th December*, 1862.

3454. E. T. Loseby, 124, Wood-street, Cheapside—Imp. in the construction of instruments for ascertaining the pressure and the moving force of the atmosphere.

Dated 27*th December*, 1862.

3456. W. H. Samson, Underhill, Wittersham, Kent—Imp. in certain machinery for cultivating land by steam power.
3458. J. Freemantle and S. Freemantle, Gosberton, Lincolnshire—Imp. in apparatus for propelling vessels.

Dated 29*th December*, 1862.

3460. M. Ker, 14, Camden-street, St. Pancras—An imp. in wardrobes or other pieces of furniture or fittings, with glass silvered doors or panels used for toilet purposes.
3462. J. H. Riddell, 155, Cheapside—Imp. in cast metal or other pipes or tubes for conveying gases, fluids, or vapours, and in the mode of connecting such pipes or tubes.
3466. G. Haseltine, 12, Southampton-buildings, Chancery-lane—Imp. in cartridges, and in the mode of charging small arms and ordnance. (A com.)
3468. W. E. Newton, 66, Chancery-lane—Imp. in preserving organic substances from decay.

Dated 30*th December*, 1862.

3472. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in ingot moulds employed in the casting of steel and other metals. (A com.)
3476. W. Mould, Belmont, near Bolton, Lancashire—Certain imp. in machinery or apparatus for plaiting or folding and measuring fabrics.
3478. W. Richards, Birmingham—Imp. in cannon and other fire-arms, and in apparatus connected therewith.

Dated 31*st December*, 1862.

3488. F. Jaques, Nelson-terrace, Stoke Newington—Imp. in cases for pipes, mouth pieces, cigars, and other analogous articles.
3490. W. Maltby, De Crespigny-park, Camberwell—Improved means of extinguishing fires by the use of substances not hitherto so applied.

Dated 1*st January*, 1863.

2. W. H. Brown, Sheffield—Imp. in battery plates.
6. R. Faulds, Glasgow—Imp. in traction engines or common road locomotives.
8. J. Jones, Rhodes, near Middleton, Lancashire—Imp. in finishing or stiffening textile fabrics.
10. W. Robinson, Birmingham—An imp. or imps. in glasses for lamps used in ships, railway carriages, and for other like purposes.

INVENTION WITH COMPLETE SPECIFICATION FILED.

483. F. Applegate, Bradford-on-Avon, Wiltshire—Imp. in the manufacture of a kind of woollen cloth, known to the trade as deerskin.—31st December, 1862.

PATENTS SEALED.

[*From Gazette, January* 13*th*, 1863.]

January 13*th*.

2019. C. Crossley and J. W. Crossley,
2023. P. A L. Canonicat.
2024. G. Fawcus.
2025. F. M. Parkes.
2026. O. P. Drake.
2028. A. Leslie.
2029. A. Couvreux.
2030. J. Green.
2031. A. Couvreux.
2033. W. Dickens and J. Hewitt.
2034. C. E. Crawley and F. Foster.
2037. G. T. Selby.
2039. W. Henson and W. W. Clay.
2044. J. Dickson.
2048. T. B. Daft.
2050. W. Gossage.
2056. R. A. Brooman.
2058. A. B. Brown.
2059. G. J. Yates and T. W. W. Tindall.
2066. T. H. Saunders and J. Millbourn.
2082. J. Daniels.
2088. T. King.
2092. J. J. Haley.
2101. J. Dickson.
2120. E. Tysall.
2126. R. Low and W. Duff.
2168. J. W. Dixon.
2169. J. W. Woodford.
2171. W. Weild.
2180. G. Haseltine.
2193. G. Coales. J. A. Jaques, and J. A. Fanshawe.
2242. W. Clark.
2253. J. Dickson.
2452. W. E. Bovill.
2527. H. Bennett.
2837. J. Duke and J. Cleaver.
2938. H. L. Corlett.
2956. M. Merryweather, R. M. Merryweather & E. Field.
2961. J. Winter.
3060. R. Sykes and P. Sykes.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[*From Gazette, January* 13*th*, 1863.]

December 31*st*.

3953. X. C. de Nabat and A. C. de Nabat.

January 5*th*.

31. A. Chambers.
39. J. Knowles.
46. E. J. Harland.
72. J. Jameson.

January 7*th*.

70. W. Cotton.
82. C. De Bergue.

January 9*th*.

58. P. Czugajewicz.
328. J. R. Cooper.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[*From Gazette, January* 13*th*, 1863.]

January 5*th*.

53. S. C. Lister and W. Tongue.
87. W. Smith.

January 9*th*.

92. H. Emanuel.